D2.5

New social media

1st Reporting period
WP2 New challenges and new methods for outbreak communication

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D2.5 "Report on new social media"

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Leader: **BMJPG** – Other contributors: **CSSC, HU**

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EXECUTIVE SUMMARY

This report aims to survey the past and potential uses of social media during epidemics. It will provide an overview of the number of global citizens who currently interact and share information on social media sites and highlight how it is now being used as a vital resource in keeping up to date with developing situations, as a technique for survival.

Social media is built on the principle of user-generated content, which means that users can now contribute towards the collective body of information and knowledge developed during a crisis. This activity can be of use to authorities involved in crisis communication because it can alert them to concerns or misinformation expressed on social media platforms and can help them prepare responses that reflect visible and quantifiable information needs. Furthermore, social media also appears to encourage prosocial behaviour, which means that the medium often compels users to share useful information and resources with each other. This has the potential to be an important asset for those involved in crisis communication and the promotion of protective behaviours.

However, as this report emphasises, organisations and individuals involved in crisis communication cannot afford simply to be reactive to messages shared and posted in this competitive environment, rather, they must take a proactive stance in establishing an authoritative presence on social media channels before and during a crisis. Whilst user-generated content can be a valuable resource to crisis communicators, there is strong evidence that the public rely on good quality information from 'official' sources to help cross-verify and make sense of the multitude of sources available on social media sites. Also, by building a community presence on social media before a crisis, organisations will be in tune with their audience's needs and can work to influence and shape the direction of discussions as they emerge.

Currently, use of social media in crisis situations is often applied inconsistently, owning to organisations' varying priorities and resources. This report highlights the benefits of using social media as crisis communication tool, as well as identifying potential challenges in integrating it into formal communication strategies. For organisations unconvinced of its potential, it is recommended that further research should be undertaken to analyse the dynamics of the social networks in order to understand more about how information spreads through them. It is also recommended that organisations should do more to analyse the data posted on social media sites in a more scientific way, by categorising the types of messages being posted, in order to quantify actual needs expressed, rather than perceived needs. By assessing these two aspects of social networks in more depth, crisis communicators could build a data driven and transparent approach to crisis communication.

Finally, this report will provide best practice guidelines on how organisations involved in crisis communication can build, maintain and assert a presence on social media.

1. Introduction

> *"In the next influenza pandemic, be it now or in the future, be the virus mild or virulent, the single most important weapon against the disease will be a vaccine. The second most important will be communication."* (Barry, 2009, p.324)

Broadly speaking, social media is a multi-way information sharing and communications tool, where users can converse and interact with each other irrespective of differences in geographical location or social background. The difference between social media (or Web 2.0 as it is sometimes known) and previous internet platforms is that it is characterised by user-generated content. (Schein, Wilson & Keelen, 2010, p.4) Within social media, users are more than just consumers of information, as the design of such platforms encourages them to share and contribute information to the network. McNab suggests that:

> "*Until recently the predominant communication model was "one" authority to "many" – i.e. a health institution, the ministry of health or a journalist communicating to the public. Social media has changed the monologue to a dialogue, where anyone with ICT access can be a content creator and communicator*." (McNab, 2009, para.4)

In recent years, there has been a shift towards social media being used not just as a platform to connect with friends and family but as the first place where users find out about breaking news stories. (Ofcom, 2011, p.46) There is a suggestion that whilst commercial organisations are yet to harness the diverse potential of social media, the immediacy of social media messaging is well suited to crisis communication. Following examples of crises where social media has been used as an efficient means of communication, Yates and Paquette (2010) concluded that "disaster response may be the ideal environment for 'proving the worth' of social media as a serious knowledge management platform". (Cited in Dufty, 2012, p.42) The increasing use of social media as a key information resource makes it a powerful user-led medium that can be used to collect and disseminate information during a crisis.

This report will cover the use of social media as a crisis communications tool. It will show how social media encourages a culture of sharing and collaboration and analyse how this has manifested in previous emergencies to help spread public health messages. This report will also include case studies on how social media has been used to track public sentiment and how analysis of this data could inform future communication strategies. In addition, the BMJ Group, on behalf of the TELL ME project has conducted an opinion survey of members of the NHS Social Media (@nhssm) Twitter community to discuss how social media could be better integrated into health organisations' communications strategies. It should also be noted that this report will not attempt to cover every aspect of social media but intends to highlight social media platforms as a viable and important tool for crisis communication, as well as identifying the challenges of integrating social media into emergency planning preparations.

2. Background on internet and social media use

This section of the report will give some background on the uptake of social media as a means to give an overview of its growing use and influence in modern day communications.

2.1 Internet coverage in the European Union and rest of the world

The International Telecommunication Union (2011, p.1) estimates that 35 per cent of the world's population use the internet, a figure which has gone up by 17 per cent between 2006 and 2011 (Fig.1) During this five year period, the proportion of developing countries who are internet users in particular has risen from 44 to 62 per cent.

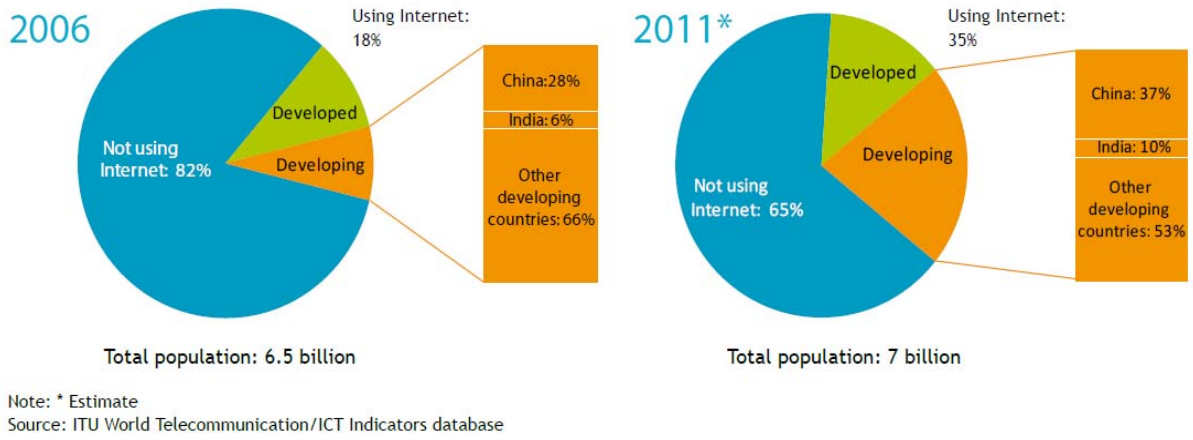


Figure 1. *Share of Internet users in the total population*. With permission from the International Telecommunications Union. Taken from *The World in 2011: ICT Facts and Figures.* ITU (2011) Retrieved from http://www.itu.int/ITU-D/ict/facts/2011/material/ICTFactsFigures2011.pdf

Whilst many organisations may view internet or social media use as largely the remit of younger generations, according to some reports up to 476 million Europeans, of all age ranges, use the internet. This accounts for approximately 65 per cent of the population, and the number continues to rise. (IAB Europe, 2012, para.3) Estimates for the time an average European internet user spends online is 27.6 hours per month, which exceeds the global mean of 24.5 hours. (comScore, 2012).

Generally speaking Europe leads the way in broadband infrastructure, with the Netherlands having the highest number of fixed-broadband subscriptions at 38.1 per 100 habitants. However, when it comes to mobile broadband (the ability to access the internet on portable devices, such as smartphones, tablets and laptops), non-EU countries lead the way, with 89.9 per 100 of South Koreans having access to mobile broadband, compared with the worldwide average of 41.6 per 100 inhabitants. (OECD, 2011)

2.2 Time spent on social media sites

The global increase in the number of internet users since 2007 has been accompanied by a behavioural shift towards social networking as many users' principal online activity. In 2011, comScore concluded that the percentage of time spent online on social networking sites increased globally from 6 to 19 per cent between March 2007 and December 2011. Thus since 2011, approximately 1 in every 5 minutes spent online is being spent on social networking sites. (comScore, 2011, p.4)

It is important to note, however, that social networking does not yet hold a monopoly on time spent communications online, with web-based Email, phone and video calls remaining popular. (Fig.2) It may be misleading to reduce different forms of internet use to discrete units of 'time spent' when, more than ever, the internet is providing opportunities for different types of media to overlap and users to multitask and move simultaneously between informal or social uses to reading the latest news story, to shopping online. (Cowen, 2009, para.6)

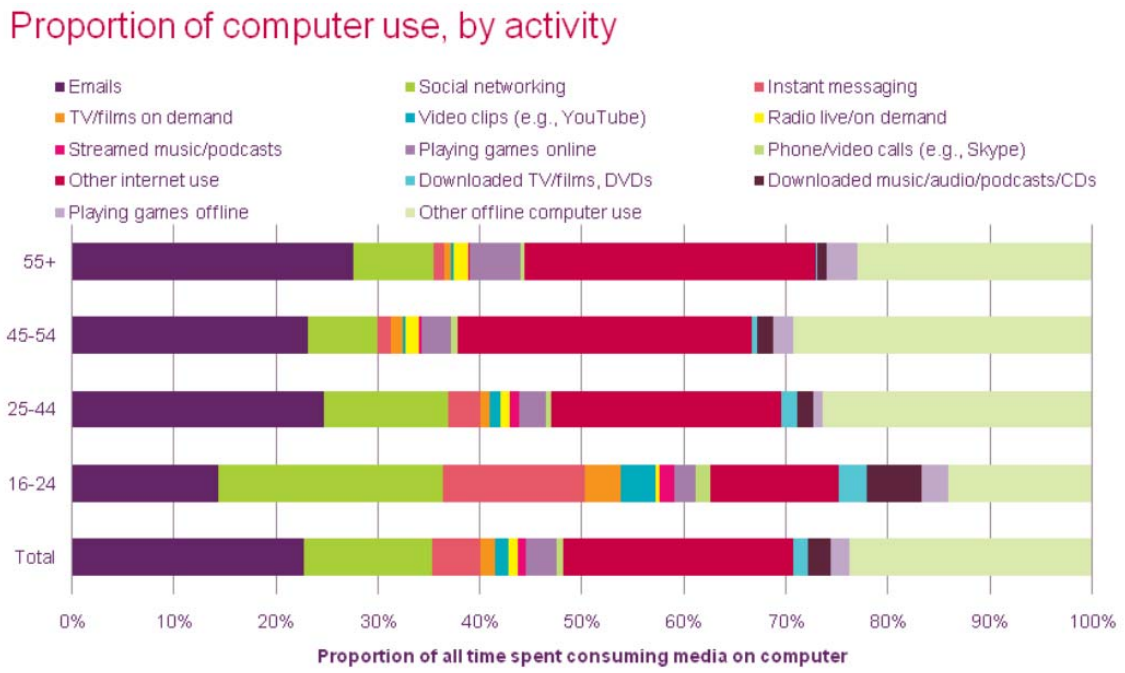


Figure 2. *Proportion of computer use by activity*. With permission from Ofcom (2011). Taken from *The Communications Market 2010.* (Fig 1.21) (Ofcom, 2011) Retrieved from http://www.ofcom.org.uk/static/cmr-10/UKCM-1.21.html.

Furthermore, social networking has become part of a Europeans' daily routine, with Ofcom finding that 71 per cent of respondents visit a social network site on a daily basis, including 20 per cent who visit a social networking website five times a day. (Ofcom, 2011, p.49) Nor is social media use restricted to younger generations, with 71 per cent of U.K. consumers aged 45-64 stating they have accessed a social networking site, with just under half saying they visit a social networking site on a daily basis. (Ofcom, 2011, p.47) Moreover, it is in these older age cohorts that the fastest expansion in social networking users can now be identified, with the "55 and over" age segment registering in a worldwide comScore study as the fastest growing users of social networking. (comScore, 2011, p.4) For example, an Ofcom report points out that as many as 86 per cent of Italians aged 45-64 claim to have used a social networking site, which is only 5 percentage points less than Italians aged 25-44. (Ofcom, 2011, p.47)

2.3 Culture and social media

Regardless of the region or age group analysed, awareness of social networking sites is becoming undeniably broad, with around 70% of Europeans having set up a page or profile on a social networking site. (Ofcom, 2011, p.47)There is notable variation in the types of social networks used across the globe (Fig. 3), although so-called 'local' social networks such as Orkut, which had been the most popular social network in Brazil until 2011, have consistently been overtaken by the most popular worldwide site,

Facebook, with only V Kontakte in Russia and Qzone in China (where Facebook is banned) (Halliday, 2010) surviving as principal 'local' social networking sites. (Consenza, 2012) Facebook has become ubiquitous in many internet users' lives to a breathtaking extent, with nearly eight out of ten internet users worldwide already in possession of a Facebook profile.

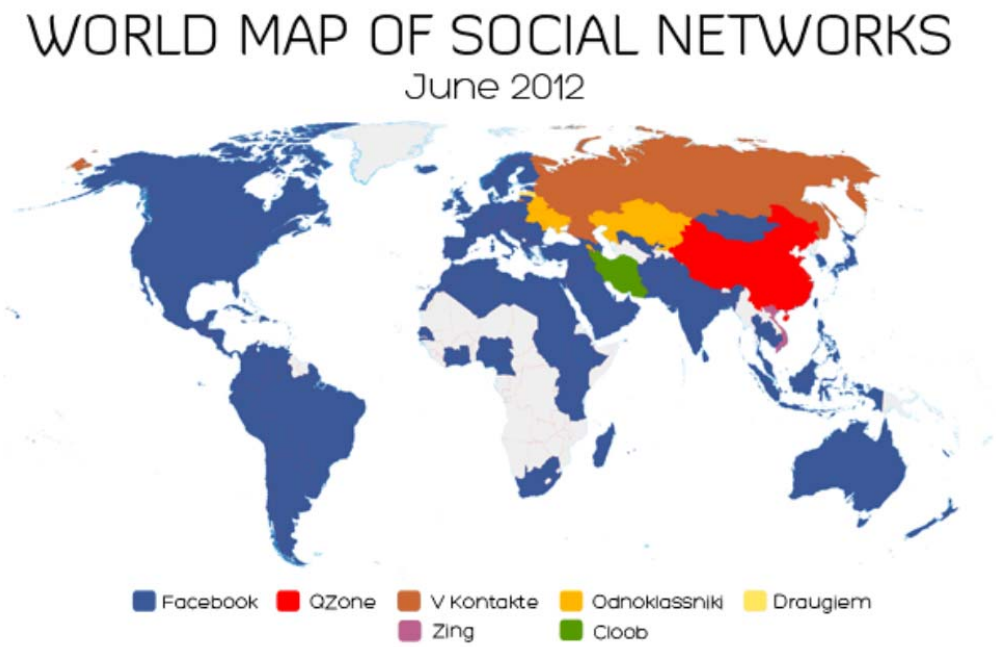


Figure 3. *World Map of Social Networks, June 2012.* With permission from Vincenzo Consenza, owner of Vincosblog. Taken from *World Map of Social Networks June 2012* (Consenza, V. 2012) Retrieved from http://vincos.it/world-map-of-social-networks/

Aside from Facebook however, in many countries, the next most used type of social media has a relatively low penetration rate of only around 22 per cent. (Ofcom, 2011, p.48) Moreover, there is considerable variation between these second most popular social networks from country to country. For example, whilst Twitter is the second most popular social network in the UK, it is only used by 24 per cent of the online population. (European Travel Commission, 2012, p.6) In France, Twitter is only used by 8 per cent of the population whilst the regional social network Copains d'Avant is more popular with 13 per cent of users. Similarly, in Germany, Wer-kennt-wen (21 per cent) and VZ Netwerke (20 per cent) are favoured over the perhaps more universally recognised social media sites such as Twitter. (Ofcom, 2011, p.48-49)

2.4 Healthcare and social media

Healthcare professionals are not exempt from increased interest in social media. By 2011, more than 40 per cent of European physicians said they used social media professionally, yet Facebook still topped the list, above Coloquio and Doctors.net.uk, as the most popular social network for professional use. (Manhattan 2011b, p.1) Irrespective of their preferred social network, many healthcare professionals employ social media to exchange case studies and clinical information in specific confidential forums, search for and discuss career opportunities and engage in discussions about the latest health news and research. Different sites require different credentials to be provided by prospective members (See Appendix I), yet most remain free to join, and some (such as BioMedExperts) aim to facilitate professional collaboration on academic projects, while others such as DoctorsHangout encourage social communication between

professionals by listing members' hobbies on their profiles. Other networks such as BMJ Group's doc2doc has over 70,000 registered users and provides a mix of clinical, ethical and news related discussions in an open forum, whilst also employing other social media sites such as Facebook and Twitter to help amplify its community's activity. In addition, other community sites such as The French Réseau Santé Social (RSS) provides a weekly service displaying maps provided by the 'Réseau Sentinelles' (an epidemiological surveillance organisation that crowdsources its data from volunteer doctors) whilst the 'DGS-ECHO' system relays urgent health alerts issued by the Direction générale de la santé (*DGS*) to RSS members. Whilst the RSS is not as developed 'socially' as other networks which tend to provide forums and host comment-based discussions, it has over 50,000 full members and reaches many other health professionals in the French-speaking world.

Most European public health authorities, if they are employing social media, tweet generalised information such as updates about protective behaviours or services that are available. While many NHS trusts have a Facebook or Twitter page, with the more successful online trusts acquiring as many as 2,058 Facebook likes or 5,182 Twitter followers, there is regional variation in user engagement. More success appears to be attained by trusts which take an informal tone when addressing users such as NHS Direct who regularly begins the day with 'Good morning Facebookers.' However, Mark Brown, editor of the U.K. mental health magazine One in Four, argues that it is necessary for health authority social networking to do more than simply 'inject' information into 'a social media space'. (Brown, 2012, para.3) There have been examples of organisations doing more than just posting static information, with NHS Direct using Twitter to engage with users, especially younger ones, by responding to tweeted questions or complaints and sign-posting users to appropriate blogs, podcasts and guides of patients living with the same condition. (Gomm cited by Whitelaw, 2011, para.9) Indeed, there is growing evidence that information is best communicated to social media users when the disseminating party provides support and information through multiple applications and platforms by linking multiple resources together. This is suited to behavioural shifts towards employing more than one internet-based platform at a time, as users become savvy in locating, comparing and filtering information from a variety of sources and media at once.

3. Reimagining human communication

3.1. A survival technique

According to Maslow's hierarchy of needs, which defines motivations for human behaviour, an individual's physiological needs are prepotent to all other needs ("Maslow", 2012, para.7) and these physiological needs can be threatened during a time of crisis, such as an outbreak of pandemic flu, for example. When in jeopardy, people employ intuitive survival techniques to protect their physiological requirements, in order to ensure the second most important component in Maslow's pyramid: safety. During a crisis, safety is secured when the right information is available. Often no one person is in possession of the full facts but by gathering and listening to a variety of sources, it is possible to develop more refined intelligence in a crisis situation. For example, the non-profit tech company Ushahidi Inc. established a website that was designed to crowdsource information about events during the post-election unrest in Kenya between December 2007 and January 2008. This website was set up as a means to collect and validate written and pictorial accounts of violence in response to a government ban on live media, which had created an information vacuum. ("Ushahidi", 2012) Because this new information came from mainly unknown or unseen sources, the need to collect as much data as possible for verification was crucial. Ushahidi went through a process of filtering the reports it received by cross referencing them. Then Executive Director of Ushahidi, Ory Okolloh, explains "Information in a crisis is a patchwork of sources. You can only hope to build up a full picture by having as many sources as possible." (Okolloh, 2009, p.65) Together, individuals can add to and substantiate social media information sources, to develop a fuller sense of the situation. Rutledge (2011) claims that humans are social beings and that Maslow's theory in fact omits two important aspects of human life, connection and collaboration; key behaviours people use to survive and progress:

> *"Humans are social animals for good reason. Without collaboration, there is no survival. It was not possible to defeat a Woolley Mammoth, build a secure structure, or care for children while hunting without a team effort. It's more true now than then. Our reliance on each other grows as societies became more complex, interconnected, and specialized. Connection is a prerequisite for survival, physically and emotionally."* (Rutledge, para.7)

Social media is the newest vehicle we have to communicate and collaborate in this way, through both its enormous popularity and natural propensity to connect individuals. Moreover, these new online platforms have "opened the floodgates" to different interpretations of age-old human behaviours. (Rutledge, 2011, para.17) People who use social media, either by design or default, are willing to contribute information that builds on shared or collective knowledge. Ultimately, in a time of crisis, safety is more likely to be obtained when information can be located from multiple sources, and contributions posted and shared on social media platforms from a variety of users can work to the benefit of shared survival.

3.2 The phenomenon of sharing

The phenomenon of sharing is a key aspect of social media and online networks. Users often disseminate information or help other users they have never seen before for any monetary exchange. This was first evident in 'support' forums where users could, for example, post a problem about a computer they have bought, or where patients can discuss their illnesses with other sufferers. Sproull, Conley, and
Moon (2005) state that: "one of the most striking social aspects of the Internet is that every day, hundreds of thousands of people voluntarily help one another on the net with no expectation of direct reward. Moreover, the helpers and those they help usually have never met face to face. Yet the help is

consequential and people are enormously grateful for it." (2005, p.139) Users can contribute in many different ways, including giving expert advice, emotional support, volunteering during a crisis, sharing files, mentoring, reviewing items, sharing photos. (2005, p.140) Similarly, peer-to-peer file sharing sites are another example of where the medium seems to encourage a culture where users host and download illegal music and film files between each other for no financial benefit and maintain this practice even though it is illegal. There have been studies that show that during a public emergency, like the 7/7 bombs in London in 2005, physical proximity was enough for complete strangers to help others in need and display altruistic behaviours. (Drury, Cocking & Reicher, 2009) This form of altruism is perhaps easy to understand because of the physical immediacy of the situation, however, why do users feel compelled to help others online? What behaviours does digital proximity encourage?

One possible explanation is that social media is a visual medium where content such as messages and photos can be shared and viewed easily, and that actions are recorded permanently for all users to see. Sproull, Conley, and Moon suggest "The visibility of behavior on the net insures that everyone who does read a discussion group will see examples of prosocial behavior (i.e. helpful messages). Moreover, they will also see that some of these messages are explicitly recognized as helpful, either by the recipient or by another reader." (2005, p.146) Furthermore, in the popular social networks, like Twitter and Facebook, users can now display seemingly helpful behaviours with great ease. For example, on Twitter a user could 'retweet' a message they have seen posted by one source, which they think will be useful or of interest to their own network of followers. Similarly, users can react to information by reposting messages on Facebook or clicking 'Like' to a post, adding further endorsement to original messages written by users.
This form of reinforcement is very easy to implement, and just one click (to retweet or like) can alert a whole host of new users to an important piece of information. Sharing is not only a generous act; it is a trusting one, for it supposes that good will come from reaching a greater number of people, which is an undeniably altruistic belief. However, whilst the fundamental aim of social media is to provide a place where users share, this environment creates a permanent record of the user's activity and is visible to the whole network. The act of sharing can be considered as being altruistic but the fact that this helpful behaviour is so clearly displayed means that the act may not be simply rewarded privately; rather, it is converted into social recognition or social capital that reinforces the identity and status of a particular user. (Sproull, Conley and Moon, 2005, p.146) Inevitably, there are numerous reasons why people interact within social networks. The 'altruistic' behaviour mentioned above could be interpreted as stemming from a self-interest associated with being recognised as helpful, or feeling more influential in a crisis. Penner, Dovidio, Piliavin and Schroeder suggest that one of the reasons why people are motivated to help is based on arousal and affect, which share "a guiding principle with learning theory that people are motivated to behave in ways that help them attain some goal—improving the person's own situation (egoistic motivation) or, in some cases, improving the welfare of another person (altruistic motivation)." (2004, p.368) Indeed, alongside digital altruism, it has been suggested that the ability to self-broadcast on social networks can feed digital narcissism. (Carpenter, 2012) During the 2009 H1N1 pandemic, Morozov (2009) criticised the quality and motivations behind certain tweets, claiming that the medium was feeding narcissistic and selfish reasons to participate, which inevitably devalued the quality of the content being posted "Too many Twitter conversations about swine flu seem to be motivated by desires to fit in, do what one's friends do (i.e. tweet about it) or simply gain more popularity. In situations like this, there is some pathological about people wanting to post yet another status update containing the coveted most-searched words – only for the sake of gaining more people to follow them." (2009, para.3) Sharing information is a key part of social media, but it is unclear what motivates each individual user to share. It could be genuine concern for their fellow users, but it could also be motivated by a need to fit in or be appreciated. Whilst it is difficult to separate each user's intentions or to know whether it is an altruistic act

or not, the fact is the medium appears to compel users to share and this dynamic could be particularly important for spreading useful information and updates during a public emergency.

3.3 News and social media

There has been a growing trend towards social media spreading the latest news stories and information and even being the first place where users find out about breaking stories. 51 per cent of 18-24 year olds with a social networking profile agreed with the statement that they often find out about breaking news stories via social networking sites. 43 per cent of UK women agreed with this statement, whilst 27 per cent of men agreed. (Ofcom, 2011, p.46) Despite the overriding popularity of profile-based social networks such as Facebook, 'microblogging' sites such as Twitter (reaches one in ten internet users worldwide) and Sina Weibo (337m users in China) uniquely encourage users to interact without being limited to interpersonal relations among friends. This form of concise, informal, rapid and open communication has led to microblogging sites to become fora where members discuss major world events and issues in real time. (comScore, 2011, p.10) According to a study by the Oxford Internet Institute, the average U.K. user now considers the internet as their most important source for information. (2011, p.43) Notably, the study also found that *confidence* in the reliability of information found on the internet has also increased, as users tend to trust the internet as much as other forms of media. (2011, p.46) This may be explained by users' growing confidence in their ability to sift through and validate information on the internet. Information from other media sources cannot be validated so immediately—for comparison, a second newspaper must be bought, or a different radio or TV programme must be waited for, yet with social media news or opinion can be cross referenced rapidly by drawing upon information posted by fellow users. The concept of the 'citizen journalist' has grown considerably in recent years and with social media tools, events can be reported much quicker that traditional media outlets. Users of social media are equipped with the tools to report and publish events as they happen and broadcast to the world. For example, the when the US Airways Flight 1549 made an emergency landing on the Hudson River in New York on 15th January 2009, local resident Jim Hanrahan reported the event on Twitter two minutes after the plane had landed and photos were on Twitter five minutes after the event. (Landau, 2011, p.20-21) In addition, the response on Twitter to the earthquake which hit Japan on 11th March 2011, was almost instantaneous. The earthquake was 9.0 in magnitude and happened at 05:46:23 (UTC) near the east coast of Honshu, which is 373m north-east of Tokyo. The first tweet about the earthquake posted in Tokyo happened at 05:48:54 UTC – 1.25 minutes after the event:

> 2011-03-11T05:48:54 Huge earthquake in TK we are affected!
> 2011-03-11T05:49:01 BIG EARTHQUAKE!!!
> 2011-03-11T05:50:00 Massive quake in Tokyo (Doan, Ho Vo & Collier, 2011, p.5)

Social media also seems to have changed attitudes towards the way news is consumed during crises, where once information was filtered through the press; it is now partially developed and verified by online users. Eysenbach claims that this is a process called 'apomediation', which is:

> *"an information seeking strategy where people rely less on traditional* experts *and authorities as gatekeepers, but instead receive guidance* from *… agents which stand-by … to guide a consumer to high quality* information *and services without being a prerequisite to obtain that* information *or service in the first place, and with limited individual* power *to alter or select the information being brokered"* (Eysenbach, 2008, p.22)

The ability to contribute towards the formulation of knowledge is a key component of social media, particularly in relation to breaking news or emerging stories. This approach presents a decentralised and democratic way of establishing knowledge about a situation and this collaboration seems to be motivated by what Wenger (2006) claims are 'communities of practice', where "groups of people who share a concern or passion for something they do and learn how to do it better as they interact regularly." (Cited in Dufty, 2012, p.42) It seems that people are partly motivated to use social media as a survival technique, because it is able to alert a user to danger or relevant information much earlier than traditional news outlets. People want to know what the risk is and so log-on to social media sites to inform themselves, as well as contribute their own knowledge, and by doing so they gain reassurance personally, and for the people they know. It could be suggested that by enabling the user to add comments about their experiences or opinions, that this gives them a greater stake and sense of ownership of a situation. Equipped with this additional responsibility and the tools to communicate, users feel compelled to contribute information that could benefit their own circumstances, as well as others.

4. Previous uses of online communication during crises

4.1 Online collaboration: SARS, 2003

A decade ago, online communities were still generally dedicated to particular interest groups or forums where users were able to share and discuss information about a topic with like-minded individuals. During the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2002, the most popular social networks of today were yet to be established. The SARS crisis ended in July 2003 and within the next month the first major general social networking site, MySpace, was founded. ("Myspace", 2012, para.2)

During the outbreak of SARS in 2002-2003, it was widely perceived that there was an unnecessary delay in communicating information about the disease to the world health authorities. The outbreak of the virus is said to have originated in China, in November 2002, at a farm in the Foshan County, ("SARS outbreak", 2012, para.1) with the epidemic reaching its peak in February 2003. The number of text (SMS) messages sent in the Guangdong providence between the 8-10th February was three times the number sent in the same time period in the previous year. (Gordon, 2007, p.310) This heightened activity indicated that mobile phone users felt compelled to communicate about something that they were either interested in or concerned about. Until this point in time, local authorities had not officially announced any form of outbreak, but on the 10th February the Chinese government notified the World Health Organisation (WHO) of the epidemic, initially reporting that there had been 305 cases and five deaths. Cyranoski (2003, para.4) reported that "Initially, Chinese officials said that the epidemic had infected about 300 people and had petered out in February. But...they admitted that by the end of February it had infected at least 806 people, causing 34 deaths." Gordon writes about the confusion surrounding the initial communication of information about the virus:

> "*It seems probable that documentation by the Chinese government concerning SARS after 20 April 2003 is generally accurate and before that date the information is questionable. Despite the high use of mobile phones and internet amongst the Chinese population, the government was at first successful in concealing and understating news of SARS to the outside world and many of their own citizens. However, the population of China makes up about one third of the global population. How did information about SARS stay outside the international public sphere for so long?"* (2007, p.309)

In addition, there were reports that despite China reporting the outbreak to the WHO, and the Chinese media acknowledging an 'atypical pneumonia' on the 9th February, that "any content related to SARS was removed on February 14th and the virus seemed to never have existed." (Gordon, 2007, p.309) Despite attempts to play down the threat, however, information about the outbreak was picked up on ProMED-mail which is a specialist listserv for experts interested in infectious diseases around the world and emails its members on a daily basis with messages that "contain new data on outbreaks or diseases, some of which are reported firsthand and some of which are reported from other sources." (Madoff, 2004, p.227) This is a low-cost and collaborative way of collecting and corroborating information relating to infectious diseases from around the world. On February 10th 2003, an US epidemiologist posted the following:

> This morning I received this e-mail and then searched your archives and found nothing that pertained to it. Does anyone know anything about this problem? "Have you heard of an epidemic in Guangzhou? An acquaintance of mine from a teacher's chat room lives there and reports that the hospitals there have been closed and people are dying.
> (Posted by Stephen O. Cunnion, M.D., on ProMEDmail, 10 February 2003) (Madoff, 2004, p.227)

The acquaintance of Stephen O. Cunnion M.D., was Catherine Strommen, a teacher from California, who had received reports of a viral outbreak on Teachers.net; the international online community forum for teachers. On February 9th 2003, Stronmen read one post from 'Ben', a user from China who described an illness "that began like a cold, but killed people in days. Several people he knew had died, and hospital doors were locked." (Drexler, 2008, p.1) Strommen then emailed her contact Cunnion to enquire if he knew anything about this virus. Cunnion then contacted ProMED-mail who appealed to the listserv subscribers with the message: "PNEUMONIA – CHINA (GUANGDONG): Request for Information." (Drexler, 2008, p.1) From this initial report, members of the listserv then began cross-referencing evidence and accounts relating to this emerging virus as a means of tracking its threat and prevalence. This collaboration continued throughout the SARS outbreak of 2003, with the creation of larger online epidemiology networks, which were fed by updates from ProMED-mail, amongst various other sources. Whilst ProMED-mail is a network of specialists, rather than a general social network, this example demonstrates how people with shared interests (teachers, epidemiologists) are willing to contribute information that might be outside their typical professional remit, but can then be used for public good. Professionals closely involved with the general public, like teachers for example, can be particularly valuable communicators of information. As suggested by this example, if professionals are equipped with the tools to disseminate their experiences, knowledge, or information sources, then they are likely to report their observations within the networks they are part of, potentially producing a ripple effect, allowing pieces of important information to be detected and added to a developing body of knowledge. The anecdotal account from teachers.net may have seemed to many an insignificant post but it was a crucial piece of information that unearthed the events taking place in China. Although this information was picked up on specialist networks in 2003, the tools and platforms now exist to share this type of information more freely, with a wider audience, on social media sites such as Facebook and Twitter.

The messages that were communicated via text message in China could now be sent through social networks to multiple recipients more easily. In 2003, the digital tools of text message, email and online communities kept vital information alive in a country that placed restrictions on its flow. Had the Chinese citizens not had these tools, the world might have received this information much later on. This early alerting of the problem allowed other countries such as Canada to prepare for the spread of the virus, as Madoff claims: "In Toronto, medical staff who were regular readers of ProMED-mail's reports learned of the existence of this deadly and contagious illness. They were thus able to respond appropriately and to isolate patients when the disease first appeared there." (2004, p.227)

It is debatable whether this type of communication chain could initiate in China once more. Gordon (2007, p.311-312) suggests that the Chinese government's implementation of the Golden Shield policy could see a limit on the free-flow of information. The policy restricts messages on the internet and those sent via personal communication devices, and there are now over 2800 facilities across China that monitor SMS messages. "If the topic is considered antisocial in any way, the message is not transmitted." (Gordon, 2007, p.312) The Chinese government allegedly aimed to restrict information about the virus to prevent panic; however, its citizens were worried and took to online communities and text messages to discuss growing concerns about the emerging virus. Preventing the flow of this information could have put lives at risk and induced panic and uncertainty amongst the population. Whilst some governments may wish to control information exchange, transparent communication about a viral outbreak is important to ensure other citizens can employ protective behaviours or at least plan in advance.

In comparison, other nations communicated more openly about the outbreak. The need for up-to-date and timely advice on the developing outbreak is crucial and the internet provided a space to post emerging

information, as well as advice to healthcare professionals and the public. During the SARS outbreak, a major source of information was the Center for Disease Control and Prevention (CDC) website, which became a primary tool for communication during SARS. In 2002, there were 3.6 million visits to the travel section of the CDC's website and between January and July 2003 there were more than 4 million visits to the same part of the website, with 1 million of these visits from users accessing SARS-related content. Interestingly, whilst being a site for US citizens, Arguin, Navin, Steele, Weld, and Kozarsky (2004, p.378) found that one third of the overall visits were made from Asia where the outbreak first developed. Whilst resources like these are important to educating and engaging the public during a crisis, their content is relatively static and not especially interactive. These are web information pages, which are very much still in the vein of Web 1.0. Social media or Web 2.0 acts in a different way because it represents an interactive web user experience, where users actively share links (to Web 1.0) sites but also to other sites, discussions, blogs which they can contribute to. The following section will look at how this process of contribution and collaboration increased during the 2009 pandemic to spread information through social networks.

4.2 Social media communication during recent public emergencies

4.2.1 How the public communicated

The 2009 H1N1 pandemic saw an increase in the general public openly communicating about the flu outbreak. Whilst still in their relative infancy, social networking sites were awash with information and messages pertaining to the 2009 flu pandemic. Nielsenwire claim that by some accounts there were 10,000 tweets that mentioned 'swine flu' in the space of an hour. (NM Incite, 2009, para.4) Twitter also reported that messages about swine flu featured twice in their top 10 news trends of 2009 (Chowdhury, 2009) and in 2011 (even when there was not a global pandemic) it was the most highest trending news subject on Twitter, beating trending topics such as the Arab spring, the earthquake and tsunami in Japan, the civil war in Libya and the wedding of Price William and Kate Middleton. (Chowdhury, 2011) Messages shared during public health crises, or indeed at any time, can contain information that can be both informative but also ephemeral. Here are a few examples, which show the variety of different types of Tweets shared during the 2009 H1N1 pandemic:

- *"Swine-flu symptoms: Checklist to see if you may be infected: … http://bit.ly/9L4Wx*
- *"This swine flu stuff is kinda creeping me out."*
- *"Monitoring the travel/swine flu scenario/issues closely. Biden didn't do the travel industry any favors yesterday!"*
- *"Thinks it's lame that they had to come up with a "politically correct" name for swine flu, to compensate for the ignorance of the masses."*
- *"New flu strain having significant indirect adverse impacts on our swine industry at a time when our producers absolutely do not need it!"* (NM Incite, 2009, para.5)

Additionally, at the height of the flu pandemic, there were more than 500 Facebook groups dedicated to H1N1 discussion and the three largest of these groups amounted to over 10,000 members. Groups were free to join and gave updates about the developing situation, allowing users to post comments and questions, which were often answered by other users. (NM Incite, 2009, para.3)

Directing the general public towards verified information always poses a challenge for public health organisations during crises, when involved in promoting protective behaviours. Arguably, social media allows the general public to report independently and without accountability. However, this type of democratised communication is also an opportunity to engage with, and understand public sentiment and

concerns, in order to prepare a timely response. Davies claims that "There have been plenty of joking references to swine flu, too, but a significant portion of the discussion seems to center around a legitimate desire to connect with others and talk about real issues." (NM Incite, 2009)

From the graph below, the interest in swine flu had risen dramatically on 1st May 2009 and this coincided with the first reports in Hong Kong of the H1N1 virus. (NM Incite, 2009, para.4) Blogs about swine flu (H1N1 virus) were far more frequent than those about other public health scares in the US (Peanut Butter and Salmonella scare) or comments about Susan Boyle, the X-Factor singer, who was a global sensation at the time.

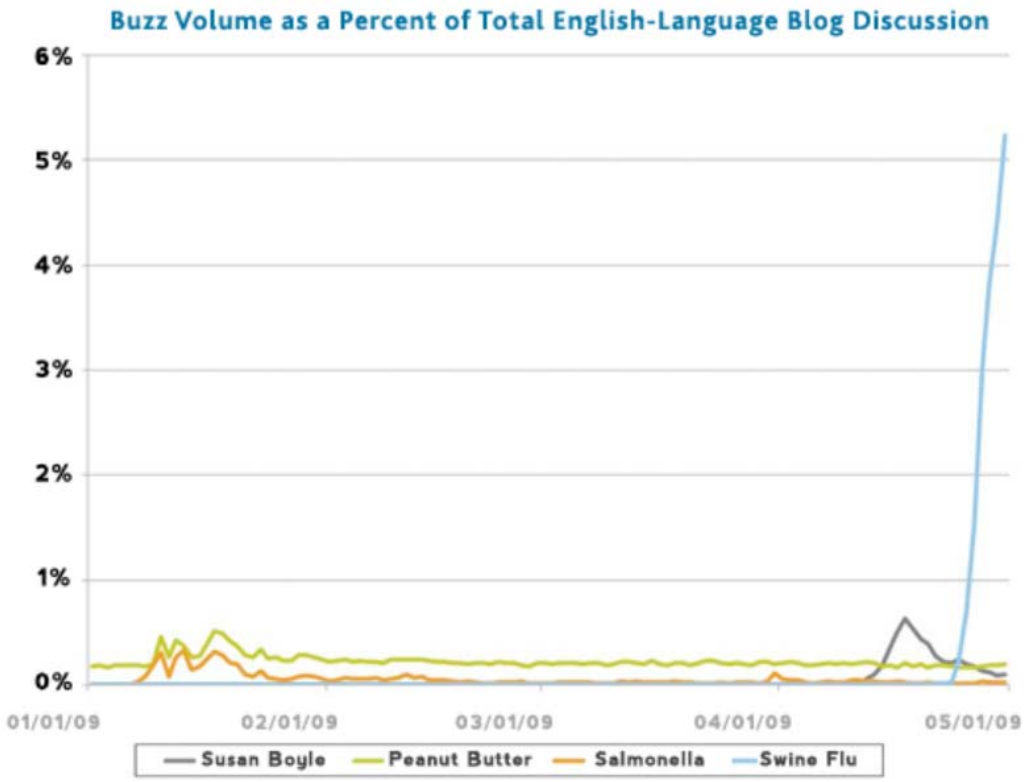


Figure 4. Buzz volume as a Percent of Total English-Language Blog Discussion. With permission from NM Incite. Taken from 'Swine Flu as Social Media Epidemic; CDC Tweets Calmly' (NM Incite, 2009). Retrieved from http://blog.nielsen.com/nielsenwire/online_mobile/swine-flu-as-social-media-epidemic-cdc-tweets-calmly/

Furthermore, there are examples such as the Flu wiki (Flu wiki, 2012), which allowed a variety of users to add to and edit to an existing body of information on the science of the virus, as well as providing tips on how to protect yourself against it. Knowledge and resources were built up by user-generated content, which was freely donated. This is an example of a decentralised process of compiling information, by a group of individuals who have probably never met, yet possess a shared concern about a perceived concern about the scarcity of information available to the general public.

4.2.2 How governments and health authorities communicated

Despite this level general of activity, research has found that only five of the EU member states used social media as a tool to reach the general public during the pandemic, with the majority preferring traditional methods of communication, using press releases and press conferences to spread messages. (Thinus, 2010,

p.3) Ways in which government agencies used social media to reach out to at-risk citizens during the H1N1 2009 pandemic included tweets made by the Alexandria, Virginia health department about where vaccine supplies were located, leading to people flocking to vaccination sites. Merchant, Elmer and Lurie claim that:

> "*Engaging with and using emerging social media may well place the emergency-management community, including medical and public health professionals, in a better position to respond to disasters. The effectiveness of our public health emergency system relies on routine attention to preparedness, agility in responding to daily stresses and catastrophes, and the resilience that promotes rapid recovery. Social media can enhance each of these component efforts.*" (2010, p.290)

The Centers of Disease Prevention and Control (CDC) set up a dedicated Twitter account @CDCemergency which provided information about H1N1, and to increase in the nation's ability to prepare for and respond to an imminent public health emergency (Fig.5).

Figure 5. Examples of tweets posted by the CDC Twitter account (@CDCEmergency) during the 2009 H1N1 outbreak. (O'Brien, 2009)

The CDC also posted a range of videos on their own website as well as on YouTube during the 2009 H1N1 outbreak. One video featured Dr. Joe Bresee, from the CDC's Influenza Division, who explained the symptoms of swine flu and warning signs to look for that indicate the need for urgent medical attention. (CDC, 2009) This video received more than 1.9m more views than the same video posted on the official CDC website, demonstrating that users will not always know to go to the 'official' sites to find information on a topical issue like pandemic flu and the importance of organisations disseminating their content and updates on numerous platforms. In addition, there were many anti-vaccine videos and humour-based videos posted by individual users that also received a high number of views which perhaps demonstrates how competitive and challenging social media spaces can be for crisis communicators. The CDC also

targeted independent and influential bloggers—to help them spread important information—and created widgets and RSS feeds displaying the latest information on the virus, for users to post on their own websites. (iHealthBeat, 2009) Other organisations like the Red Cross also set up Twitter accounts and disseminated and shared information (fig.6).

Figure 6. Examples of tweets posted by the American Red Cross (@RedCross) during the 2009 H1N1 outbreak. (O'Brien, 2009)

In addition to the 2009 H1N1 outbreak, other emergency services have used social media to provide real-time information during a time of public emergency. For example, during the 2011 floods in Queensland, Australia, the Queensland Police Service set up a Facebook page to give the public regular updates and to engage with users about the developing situation. Throughout the three days of flash flooding in Toowoomba and the Lockyer Valley, and during the period of rising flood waters in Ipswich and Brisbane QPS, 2011, the Police Sevice's Facebook profile page received an increase from 20,000 to 160,000 'likes', that acted as subscriptions, demonstrating the peoples' desire to receive updates on an uncertain situation. (Taylor, Wells, Howell & Raphael, 2012, p.20) Furthermore, other government agencies, councils and NGOs set up Facebook pages during these disasters in an attempt for the authorities and the public to exchange critical information, post relevant photos (road closures, flooding) and to appeal for volunteers. Furthermore, in response to Cyclone Yasi which was forming near Fiji at the time, a local teacher set up a dedicated Facebook page to provide information and support and to allow citizens to post updates in an attempt to enable people to "help themselves". (Taylor, Wells, Howell & Raphael, 2012, p.22) Similarly, Project EPIC in the US has been used to encourage users to submit updates using specified hashtags on Twitter (such as #closed, #shelter, #damage) . This simply coded information may then be easily computated and rapidly mapped onto a Google map, to help people understand where is safe to go. During more recent crises, such as the earthquake and tsunami that hit Japan in March 2011, when infrastructures were devastated and many modes of communication rendered useless, the use of Twitter and other social networks was common among doctors, who communicated to chronically ill patients about where they could obtain essential medicines. Two cardiologists at Keio University involved Yuichi Tamura and Keiichi

Fukuda wrote in a letter to *Lancet* that "These 'tweets' immediately spread through patients' networks, and consequently most could attend to their essential treatments." (Tamura & Fukuda, 2011)

Social media has been used in a variety of ways by organisations that aim to protect public health during an emergency. However, most organisations have not embraced social media as a key communications tool during a crisis, and remain unsure of how to harness it to achieve their strategic aims. With the burgeoning use of social media, however, organisations cannot ignore the fact that many users are searching for news or information on these channels. There is great potential for organisations to share, interact and collaborate with the public, although the use of social media is inconsistently applied across national and international organisations. The following section will look at potential problems caused by the lack of an assertive social media presence by organisations, and will analyse the ways in which organisations can assess and utilise data posted on social media sites to their advantage.

5. Case studies of social media

5.1 How does Twitter deal with misinformation?

One concern about social media is that it has the potential to generate and perpetuate rumour. For example, Morozov argues that searching for a particular term such as #swineflu on Twitter is not a reliable way to access trustworthy information because it does not allow for context. Morozov lists several tweets which could be perceived as inducing panic:

- *I'm concerned about the swine flu outbreak in us and mexico could it be germ warfare?*
- *In the pandemic Spanish Flu of 1918-19, my Grandfather said bodies were piled like wood in our local town....SWINE FLU = DANGER*
- *SIMPLE CURE FOR THE NEW BHS (BIRD/HUMAN/SWINE FLU) AS REPORTED ON TV LAST NIGHT IS THE DRUG TAMIFLU....ALREADY A PRESCRIPTION ON THE MARKET*
- *Be careful...Swine Flu is not only in Mexico now. 8 cases in the States. Pig = Don't eat*

(Morozov, 2009, para.6)

However, whilst on an open platform such as Twitter, users are free to post any message, and others are free to search and read them, the vast collaborative networks that comprise social media often question and correct rumours posted. Users are not likely to just read one post about a trending subject but will negotiate through and filter numerous sources. Cowen, suggests that "the mass migration of intellectual activity from print to the Web has brought one important development: We have begun paying more attention to information." (2009, para.4) Whilst there is more information out there on the web, many users naturally verify information and question where it is from. Whilst the 'citizen journalist' can report on events ahead of reports by other media outlets or organisations, users are still wary of sources and, even on Twitter, hold official sources in high esteem, often seeking verification before believing alarmist messages.

Intelligence is built on the comparison and corroboration of various sources. Hilton and Smith suggest that "In countries affected by outbreaks research into people's willingness to comply with public health recommendations suggested that this largely depended upon people's understandings and assessment of the perceived risk of contracting the infection and its severity.**"** (Hilton & Smith, 2010, p.2) This is to say that the effectiveness of a communications response to public concern relies upon the ability of health agencies to engage the public in a factual discourse about the extent of an emergency, through all communication channels, including social media. By being a proactive communicator on social media, health authorities and healthcare professionals can establish themselves as a reassuring voice of reason, satisfying the information needs of the public, and helping it to comprehend the scale of the risk as well as being on hand to discredit any erroneous information that appears. Whilst tapping into and assessing public sentiment can be useful to an organisation when structuring crisis response, it is equally important to be a pro-active force in confronting rumours and publishing authoritative information which the public can trust.

To illustrate how rumours start and spread, Procter, Vis and Voss (2011) illustrate how one user's tweet was retweeted several times during the Birmingham riots in England, August 2011, leading to a rapid spread of misinformation. In the space of 30 minutes the rumour of riots in a Birmingham children's hospital gained momentum through the simple process of people retweeting a dramatic

tweet that contained no reference to back up the claim. The circle on the left of Figure 7 (below) shows the network where the rumour began. The user @jazz_kaur, who had 113 followers started the rumour (blue circle) and this tweet was then picked up by retweeted by @HarrysLips (black circle), who had a much larger following of 5,320. This message then continued to reach more and more people through associated networks, with some users emphasising its significance by retweeting it.

RT @jazz_kaur: #londonriots #birminghamriots Apparently the rioters are moving towards Birmingham children's hospital.
@HarrysLips, 5,320 followers Mon 8 Aug 20:04

Figure 7. Initial tweet from user @jazz_kaur, suspected to be erroneous information. With permission from Guardian News & Media Ltd. Screenshot taken from *How riot rumours spread on Twitter: Rioters attack a children's hospital in Birmingham*, Procter R., Vis, F. & Voss, A. (2011). Retrieved from http://www.guardian.co.uk/uk/interactive/2011/dec/07/london-riots-twitter

Approximately 45 minutes after the original tweet, this misinformation was retweeted and elaborated on in subsequent tweets (see Fig 8. below). The green circles show the number of users reinforcing the rumour through retweets or similar messages, and the red circles are the users who are refuting the rumour.

Figure 8. How @jazz_kaur's tweet was picked up, elaborated on and an amplified by other users. With permission from Guardian News & Media Ltd. Screenshot taken from *How riot rumours spread on Twitter: Rioters attack a children's hospital in Birmingham*, Procter R., Vis, F. & Voss, A. (2011). Retrieved from http://www.guardian.co.uk/uk/interactive/2011/dec/07/london-riots-twitter

In the space of an hour more information came to light and, there emerged a growing number of voices challenging the original rumour (Fig.9 and Fig.10).

Figure 9. Example of the Twitter community challenging a rumour by cross-verifying with offline sources. With permission from Guardian News & Media Ltd. Screenshot taken from *How riot rumours spread on Twitter: Rioters attack a children's hospital in Birmingham*, Procter R., Vis, F. & Voss, A. (2011). Retrieved from http://www.guardian.co.uk/uk/interactive/2011/dec/07/london-riots-twitter

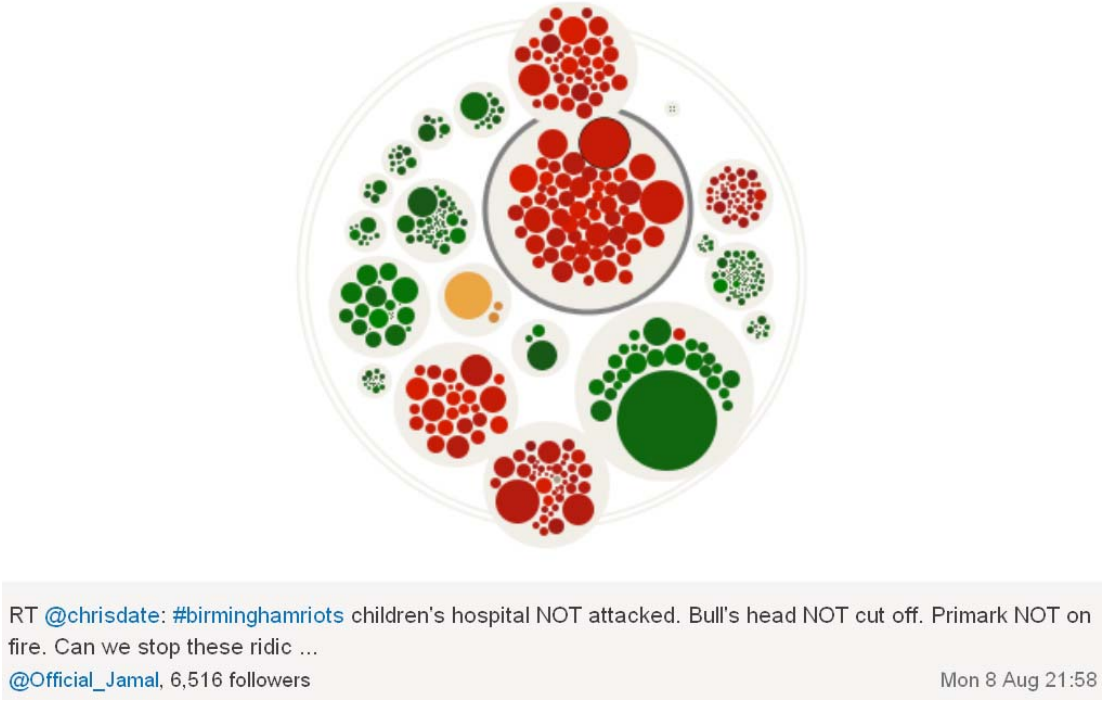


Figure 10. Further example of Twitter users working together to combat rumour. With permission from Guardian News & Media Ltd. Screenshot taken from *How riot rumours spread on Twitter: Rioters attack a children's hospital in Birmingham*, Procter R., Vis, F. & Voss, A. (2011). Retrieved from http://www.guardian.co.uk/uk/interactive/2011/dec/07/london-riots-twitter

What this example also illustrates is that searching for information about an emerging situation via a relevant hashtag or search term does not always render reliable information to the user. Context is often difficult to convey in 140 characters but this example also displays the benefits of collaboration in an information network, such as Twitter. The rumour spread because it was dramatic news and because it was not challenged immediately. However, as more people on Twitter found out about it, they began to cross-verify and check with official sources, both online and offline, to corroborate reports. Despite this misinformation spreading, in the space of two hours, the Twitter community was able to discredit the rumour; this example also demonstrates how users who are part of social networks embrace collaboration as a means to refine the quality of the information being produced, so that they feel able to make informed judgements. In the end, it was through official verification that the rumour was quashed and this shows the significant impact that official organisations can have in correcting rumour and reducing panic quickly.

5.2 Content analysis of tweets during the 2009 H1N1 pandemic

As mentioned above, 10,000 swine flu-related tweets were posted within the space of an hour during the 2009 H1N1 outbreak. These messages came in different forms, ranging from users retweeting CDC health alerts to more personal statements, such as, “I gots da flu”, or “sick with this flu it’s taking over my body

ughhhh." (Paul & Dredze, 2011, p.1) How can we quantify the value of this content? From it, can we learn about public sentiment? Or analyse the significance of the different types of information being exchanged?

Social media users originate from a variety of backgrounds; they may work in government departments as professionals and experts, or they may form part of the general public, for whom the use of social media is a means to relax, socialise, or inform themselves about the latest debates and news. This means that messages can range in tone and emphasis; particularly during a public health crisis. Posted content in a crisis can range from practical 'key' information about what to do (symptom recognition, where to get vaccinated, or find help etc.), to users' individual responses; their thoughts and opinions about the crisis. As with all human commentary, personal responses encompass everything from efficient reporting, to worry, exaggeration, and even humour or sarcasm.

In their study 'You Are What You Tweet: Analyzing Twitter for Public Health', Paul and Dredze make the point that individual tweets, "contain little informational value but the aggregation of millions of messages can generate important knowledge" (2011, p.1). In other words, this plethora of varied commentary can in fact be collated and assessed to provide "an instantaneous snapshot of the public's opinions and behavioural responses." (Chew & Eysenbach, 2010, p.2) As demonstrated above, users themselves assess various sources on social networks to make an informed choice. Therefore, organisations involved in crisis communication should employ a similar tactic, where communication responses are based on evidence selected from multiple sources.

With the right tools, is possible to 'mine' or 'scrape' a multitude of messages about a topic (the H1N1 virus for example), which they can then be assessed on a large scale to gauge overall public sentiment about a trending topic or concern. Social media is unique because it can give us a greater sense about what people are thinking, which can be accessed more widely and more immediately than public reaction to a newspaper article or a TV news bulletin. In their study, Chew and Eysenbach call this 'mining' approach as ''infoveillance'' or "infodemiology". (2010, p.1) They analysed the content and context of tweets to see if deeper analysis could reveal more about the types of messages being exchanged. Between May 1st and December 31st, they archived over 2 million Twitter posts which contained the keywords ''swine flu,'' ''swineflu,'' and/or ''H1N1", and then took 5,395 of these tweets at random to analyse what types of messages were shared. Tweets were categorised into different types of messages, from: resource, personal experience, personal opinion and interest, joke/parody, marketing and spam.

Significantly, H1N1 'resources' and news stories were found to be the most common type of content shared (52.6%), followed by personal experiences (22.5%), humour (12.7%), concern (11.7%) and questions (10.3%). Only 4.5% of the tweets analysed were categorised as containing misinformation. In addition, 61.8% of the tweets contained links to external sites, with 23.2% of all posts linking through to a news website. However, only 1.5% of the tweets analysed linked to government and public health agencies. (Chew and Eysenbach, 2010, p.7-8)

Chew and Eysenbach also found that peaks in twitter activity usually coincided with major news stories, for example, there was a sizeable reaction to WHO's Pandemic Level 6 announcement on June 11 (label 'A', Fig. 9), which was widely reported in the traditional media. However, it is also interesting to note that in their analysis, tweets which contained 'concern' (expressed self, others, by emoticons or in general) spiked massively (30.66% of all tweets) on July 5th, following the announcement that Harry Potter actor Rupert Grint had caught the virus (Fig 11) –which also coincided with the highest peak in humour-based tweets.

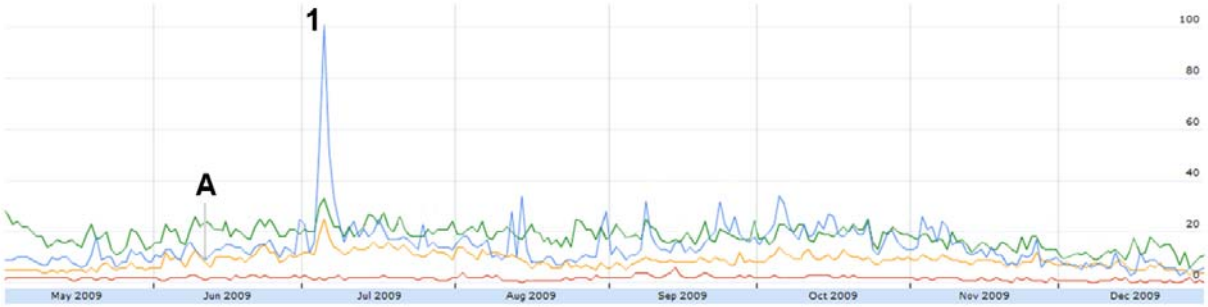


Figure 11. The relative proportion of tweets expressing concern from May 1 to December 31 2009. Blue = concern for others. Red = concern for self. Yellow = concerned emoticons. Green = general concern. A = June 11: WHO pandemic level 6 announcement. 1 = July 5: Harry Potter actor Rupert Grint has H1N1. Reproduced under the Creative Commons license. Taken from *Pandemics in the Age of Twitter: Content Analysis of Tweets during the 2009 H1N1 Outbreak,* Chew, C., Eysenbach, G. 2010, *PLoS ONE* 5(11) p.9, Fig.9.

Chew and Eysenbach also found that the type of content produced also changed over time, with personal accounts regarding the H1N1 virus increasing with time, while the amount of humorous accounts decreasing perhaps "due to the increasing perceived seriousness of the situation and/or the declining popularity of the subject." (2010, p.8) In addition, their findings suggest that overall tweet volume is positively correlated to an increase in 'perceived threat' during a public emergency, as well as to an increase in news coverage.

Analysing tweets is a good way of measuring the types of messages being posted and shared. On the whole, the results of Chew and Eysenbach's study are encouraging because the majority of the tweets were informative and linked to news websites. However, for the organisations or individuals assessing the semantic quality of the tweets then sophisticated software is required to tease out the meaning and context of what is being posted in real-time. Chew and Eysenbach point out that whilst links to public health and government authorities were low (1.5%), this might reflect "the lack of critical assessment and evaluation of online health information by consumers." (2010, p.11) This also suggests an issue with the way health information is presented as users were able to disseminate vast amounts of news updates but there seems to be a lack of visible health information available to share within the network.

From the content analysis in Figure 12 , which shows tweets containing 'personal experiences', it is clear that there were certain points during the crisis where the mention of personal or family members' experiences peaked. By monitoring expression of sentiment in this way, public authorities could respond to these real concerns of users and react accordingly. The timely provision of information in this context could reassure the public of agencies' ongoing efforts, perhaps helping people to make an informed decision about either their own health, or that of someone close to them, either in a physical or digital context. Chew and Eysenbach's study shows that monitoring social media and analysing messages in this way is a more scientific means of gauging online sentiment and to providing a timely response. Messages that could be interpreted as concern could be directly addressed. Whilst it is difficult to interpret the exact tone and context of these messages, when assessed on a large scale they can give useful indicators about the level of panic, which is otherwise relatively intangible, yet important for authorities to understand. Similarly, sarcastic or humourous messages could be responded to by authorities with posts to increase awareness of impending risks that people may want to consider more seriously.

Figure 12. The relative proportion of tweets sharing personal experiences from May 1 to December 31 2009. Red = indirect (family/friend) experience. Yellow = personal/direct experience. Blue = vaccination experience. A = June 11: WHO pandemic level 6 announcement. 1 = Oct 6: H1N1 vaccinations arrive in the US. Reproduced under the Creative Commons license. Taken from *Pandemics in the Age of Twitter: Content Analysis of Tweets during the 2009 H1N1 Outbreak,* Chew, C., Eysenbach, G. 2010, *PLoS ONE* 5(11) p.9, Fig.8.

It is important to remember that whilst the social network medium can give us an indication of sentiment, there are many drawbacks to using this data as a direct interpretation of general public mood. Chew and Eysenbach acknowledge that 50.8% of its total users are Americans and only 19% of Americans use Twitter. (2010, p.12) It is also important to note that not all of these messages are useful when planning a crisis. For example, humourous posts were not classified as being misinformation, but they might not be helpful in encouraging an efficient response to public health concerns. Furthermore, Twitter is only a small representation of a population (even though users may refer to people they know or localities affected) and not all Twitter users will report a problem even if they have it (preferring to just watch the comments unfold). However, whilst not one hundred per cent accurate, social media presents health authorities with an unprecedented volume of real-time information, potential intelligence on crisis spread, and can reveal gaps in information and resources which the public require.

At the start of the 2009 H1N1 outbreak there was much uncertainty about how prevalent the virus would be—estimates ranged between 5% and 30% of the UK population contracting the virus, with some predicting up to 65,000 deaths—and people may have been wary of the fact that this was the first pandemic to occur in more than 40 years (Hilton & Smith, 2010, p.1-2). In previous health epidemics, surveys were often conducted yet there was often a time lag in collecting results, meaning that any response or resources designed to correspond with findings could become very quickly outdated. Through careful analysis like Chew and Eysenbach's study, sentiment can be tracked in an evidence-based way and this information can be used to make rapid judgements on how to respond to the public's concerns. They state that "Tracking tweeted misinformation and questions is potentially useful for public health agencies to address information needs of the public and direct online and offline health education initiatives and campaigns." (Chew & Eysenbach, 2010, p.11) This study manually classified the tweets into categories, but during a public health crisis however Chew and Eysenbach conclude that "more advanced semantic processing tools may be used in the future to classify tweets with more precision and accuracy."(2010, p.12) This study shows that a lot can be done to accurately track sentiment, but the question is whether organisations can afford -financially and operationally- to invest in these tools and resources to monitor and act on the sentiment expressed on social media in real-time.

These two cases studies demonstrate the way in which social media activity on Twitter has been monitored and analysed to track behaviour during real or potential crises. However, it must be noted that whilst the two cases studies covered in this report focus Twitter as a means to track and intercept sentiment, it is

possible for this process to be replicated on other social media sites. The reason why Twitter dominates the field of tracking online sentiment is that it is an open source medium. Under its terms and conditions, it allows researchers or analysts to view users' public comments or track trends, which can then be 'mined' for analysis. In contrast, the world's most popular social network Facebook has more complex rules over how data about users' activity can be accessed and used. Firstly, only public profiles and pages can be openly accessed, yet most users belong to closed networks which might only be directly penetrable by targeting adverts to specified groups. Furthermore, Eysenbach and Till (2001) claim that: "internet based research raises several ethical questions, especially pertaining to privacy and informed consent." Data that is made publicly available, either by the individual user or under the terms and conditions of the social network, is generally considered as free to utilise for sentiment analysis. However, Wilson claims that since March 2011, Facebook has stated that data cannot be collected using automated analysis or data crawling tools without the explicit approval of Facebook Inc. (2012, para.9) Privacy rules such as these make it more difficult for those involved in crisis communication to truly utilise the data being shared on social media sites, in order to prepare public health responses which reflect a network's need. Each social networks will have different rules on how users' data can be accessed or used but if public health authorities and researchers can ethically obtain this data from individual networks, it has the potential to inform research and develop precise communication responses that meet a need that can be quantified which is unprecedented in terms of planning crisis communications.

6. Integrating social media into crisis communication strategies

6.1 Introduction and rationale

For the purposes of this report, it was decided to focus the research on how organisations involved in crisis communication could use social media more effectively during public emergencies. As originally stated in the Tell Me Description of Work booklet, the BMJ Group were asked to carry out a survey of its online doctors community doc2doc. Following initial interviews with founding members of the community, the common belief was that asking individual healthcare professionals their opinions on using social media during a crisis is likely to be heavily influenced by the organisations that employ them. From a UK perspective, there is much concern about healthcare professionals using social media. Both the General Medical Council (GMC, 2011) and the British Medical Association (BMA, 2011) have recently published guidance on doctors' use of social media and an article in *The Lancet* states that "current guidance focuses more on the risks than the benefits of doctors' use of social media." (Lancet, 2012, para.2) This statement seems to sum up the position of most public health organisations in regards to their employers using social media. Fear of litigation or damage to the reputation of the organisation or an individual over something posted on a social media site has caused the health profession to be wary of the uses of social media. In light of this, it was decided that BMJ Group would collaborate with the @nhssm Twitter community, which is a collective of healthcare professionals, healthcare directors and public health communicators, who discuss the opportunities and realities of integrating social media within the NHS. It was deemed that this approach would provide a valuable insight into how the NHS and other healthcare organisations view the role of social media in crisis communication, as well as understand the challenges in integrating it in communication strategies.

6.2 The importance of social media communication during a crisis

In reference to the 2003 SARS outbreak, Semaan, Mark and Al-Ani claim that the Chinese government placed restrictions on all media outlets limiting the publication of any SARS related stories "to decrease the likelihood of mass panic." (2010, p.6) As rumour about an outbreak spread, this lack of information arguably created the opposite effect, as citizens who were unsure of what was happening were unnerved, and began to talk amongst each other to find out more about the 'unofficial' virus. For the international community, individual accounts began to add weight to intelligence about what was happening in China, yet this disparate process also developed erroneous and conflicting information, only adding to the confusion. The ethos of the social web is one of transparency and openness, encouraging information to be exchanged freely in a variety of ways. Authorities should now expect crises to be discussed on such platforms. In order to assert their authority and expertise, organisations should aim to reflect this ethos by participating and contributing to the debate, rather than ignoring or suppressing it. Furthermore, there is evidence that even amongst the sea of user-generated content available on social media; the public are predisposed to value 'official' voices. In a survey by the American Red Cross about social media communication during crises, 80% of respondents said that they expect national emergency response organisations to monitor and interact and provide information on social media. (American Red Cross, 2011, p.17) However, it appears that public health agencies fall short of such expectations; failing to establish a presence on social media platforms and to engage non-professional users with crisis-related health information (as illustrated by Chew and Eysenbach's study in which only 1.5% of tweets included links to government and public health agencies). (2010, p.8)

In addition, a survey carried out by Taylor, Wells, Howell and Raphael (2012), of 1,146 respondents in Australia and New Zealand who had used social media during recent natural disasters, found that 75% of respondents said that they would check Facebook for the latest news (compared to 85% who said they would check TV news) and 31% said they would use Twitter to get updates. Also, 56% of respondents claimed that they would equally rely on updates from official response agencies and information from social media, but only 6% said that they would trust non-official sources on social media more than the 'official' voice of response agencies. (2012, p.23) This seems to suggest that response agencies could benefit online from their established offline authority, and that they should recognise that the places where citizens are seeking information is changing. It is now the responsibility of expert agencies to interpret this changing landscape and ensure that they are present as a key information provider and point of contact during a crisis. Morozov claims that during the 2009 pandemic, the CDC's emergency Twitter account was one of the few official accounts which to post information but asks questions about the presence of other key organisations involved in the management of the pandemic:

> "*But what about the rest of the US government or international institutions like WHO? In an ideal world, they would have established ownership of most online conversations from the very beginning, posting updates as often as they can. Instead, they are now faced with the prospect of thousands of really fearful citizens, all armed with their own mini-platforms to broadcast their fears -- which may cost it dearly in the long term*." (Morozov, 2009, para.9)

It is important for authorities to 'establish ownership' and authority over crises discourses, particularly online, where information and sentiment can change so quickly. Whilst organisations cannot necessarily control the messages being exchanged, they can be a visible presence that spreads trustworthy advice and information. Increasingly, social media is becoming the medium through which users want to find out about breaking news, and this platform also allows them to comment on it and broadcast it to their network. By actively engaging with sentiment and activity online, organisations could have a stake in the conversation and users in their collaborative networks are likely to cross verify and endorse information supplied by official sources, to ensure that quality information is being produced for the benefit of their network. One example of how an authority established ownership of an online discussion in order to disperse rumour was during the UK riots in August 2011, local policeman Superintendent Mark Payne from Wolverhampton took to Twitter to counteract rumours with reliable updates which reassured the public.

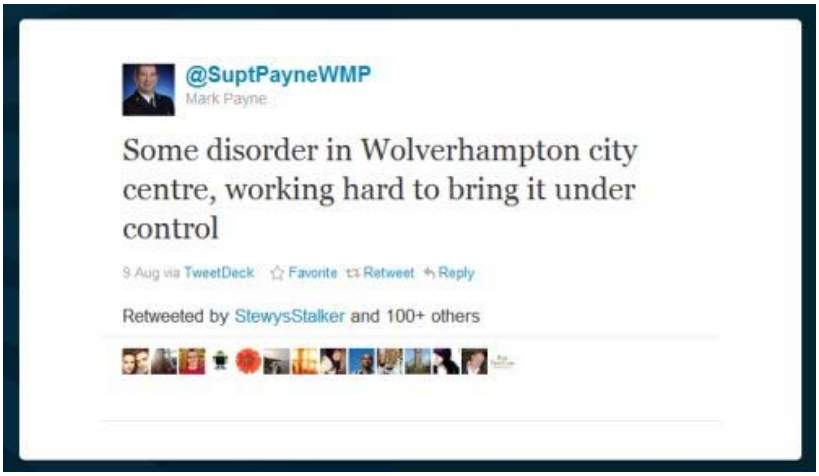


Figure 13. Example of a tweet sent by Superintendent Mark Payne during the disorder. (Brightwell, 2011) Retrieved from http://blog.public-i.info/2011/08/how-bloggers-and-police-countered-riot-rumours-in-wolverhampton/

Being an official source meant that his updates provided reliable information to the people of Wolverhampton and his comments were also reposted by individuals who ran a Facebook page called WV11, which gave updates on the unfolding situation. Steph Jennings of the WV11 blog said: "When we set up WV11 we made a decision that we'd only ever report things if we knew they were fact, so getting updates from Mark and other police officers was really valuable." (Brightwell, 2011, para.8) During this time of crisis Superintendent Payne became a trusted presence online. This openness sought to dispel any rumours and reduce anxiety by keeping local citizens up to date with the work of the police. The public now demand openness online but this may seem like a paradox to most organisations. Authorities may seek to have a degree of control over messages they post particularly if facts are still emerging or are yet to be verified. However, failure to participate, and to allow the anecdotes of the crowd to completely sway the direction of sentiment and the information being produced could have a detrimental effect.

However, it could be argued, that reporting events (in the example of Superintendent Mark Payne) and the distribution of health or scientific information are two different forms of communication. Waldock claims that most scientific communication is developed and agreed advance under stable conditions, but that "in emergencies where there is significant time pressure, and the scope of the events and their impact is still emerging and volatile, scientific communication has to adapt to delivering information urgently to a mix of stakeholders." (Waldock, 2012, p.1) There are times when this type of sensitive information is difficult to discuss online; or when authorities are not in possession of the full set of facts. One of the most prominent communication challenges of the 2009 H1N1 pandemic was public opinion against vaccination – avoiding panic and explaining the usefulness of vaccination. (Thinus, 2010, p.5) There was widespread questioning of its efficacy, potential long-term side-effects, and the conflicts of interest surrounding the production of the vaccine (Cohen, 2012) and one survey stated that respondents were often more concerned about the risks of the vaccine than the virus itself. Hilton and Smith explain that:

> "*The key concerns expressed were about the speed of its [the vaccine's] development and whether it had been sufficiently trialled. For instance, one participant commented: '... there's not enough trials being done before its being sent out because they're in such a rush to get it out to people.' It was also common for participants to link perceptions about rushed trials to concerns about long-term side-effects. For example, one participant said: 'they haven't tested the implications on your body in five years time or ten years time, which is what worries me.'* "(Hilton and Smith, 2010, p.7)

Whilst organisations might not possess all the answers regarding long-term side-effects of a vaccine, it is still important for them to remain open and transparent about the benefits and risk. There have been recent efforts to be more open about uncertainties around vaccination, such as the Twitter discussion #flusurvey, which was a real-time question and answer forum hosted by Dr Chloe Sellwood, NHS London's Pandemic and Seasonal Flu Lead. (NHS London, 2011) Dr Sellwood responded to questions from both the public and healthcare professionals on the flu vaccine and this was a good exercise in engaging with the public's concerns about vaccination and responding to them in a transparent manner. However, there are still online groups and forums that are sceptical of the efficacy, production and side-effects of vaccines and it seems reasonable that if authorities want to reduce the panic surrounding vaccines, they could aim to explain the risks and benefits in an open and transparent environment and be willing to engage with scepticism, in order to overcome it.

6.3 Current state of play

During a public health emergency, there are a variety of organisations that disseminate health information updates, from World Health Organisation (WHO), ECDC or CDC, to the Health Protection Agency (HPA) in the U.K., national health organisations like the NHS, as well as local health authorities, healthcare professionals, emergency services, and the media.

The goal of many of these organisations is to protect public health and safety; however, their strategic objectives and resources will vary amongst organisations. Currently, social media may have little or no part in organisations' overall crisis communication strategy. Amanda Coleman, the Corporate Communications Director at Greater Manchester Police (GMP) has suggested that as a result of the 2011 UK summer riots, large organisations involved in crisis or emergency communication may need to rewrite their communication plans. Coleman argues that the public are able to "give immediate feedback on what they are seeing, can provide footage or photographs of incidents to help find those individuals involved, and can join with others to be a force for good." (Coleman, 2011, para.4) Police and other organisations could view the immediacy of this information as a resource, and by harnessing it to compliment their investigations and also actively address concerns expressed at the time of a crisis.

Various crisis response organisations differ in the maturity of their social media policy. There are impressive examples such as the London Ambulance Service who use Twitter (Fig.14a) and Facebook (Fig.14b) to provide information on nearby resources and as a means of providing rolling commentary to promote the work of the service. For example:

Figure 14a. Examples of tweets made by the London Ambulance Service Twitter account (@Ldn Ambulance). (London Ambulance Service, 2012a) Retrieved from https://twitter.com/Ldn_Ambulance

Figure 14b. Examples of Facebook posts made by the London Ambulance Service on Facebook. (London Ambulance Service, 2012b) Retrieved from http://www.facebook.com/londonambulanceservice

In contrast, some organisations are new to social media and are only beginning to integrate it as part of their communications strategy. Some organisations might be very 'hands-on' and reactive – by responding to the situation as it emerges - such as in the case of superintendent Mark Payne. On the other hand, some organisations might have a more measured approach to social media; planning posts in advance, to supplement other media communications, such as press releases or weekly reports. These are all valuable types of interaction and depending on the organisation as well as the personnel involved, social media adoption will be reflected in different ways.

6.4 @nhssm chat A: Social media and emergency planning

As part of this research project, we conducted two hour-long Twitter chats in collaboration with @nhssm (NHS social media); a Twitter community dedicated to NHS staff who are interested in discussing the uses of social media in healthcare. It has a following of 7,000 followers and rising. This collaborative exercise was useful in gauging opinion among professionals involved in healthcare, at both a clinical and strategic level to understand how exactly social media could be utilised during a public health epidemic.

N.B. The full transcript of both discussions can be found in the references marked @nhssm, 2012a and @nhssm, 2012b. Please note that some of the following quotes below include tweets posted during the course of the discussions, in which language has not been altered.

Our first chat (A) was entitled: Social media and emergency planning –what has worked in the past? (@nhssm, 2012a) During this discussion we were able to question NHS staff directly about how their organisations employed social media during previous public health emergencies. Points to summarise the discussion include the view that the public and individual community groups provided valuable insight into events during the UK riots in 2011, and Liverpool Community Health NHS Trust (@NHSLiverpoolCH) claimed that "the riots really highlighted SM [social media] to directors and senior staff. It is now open to all Trust staff to use and engage!" Also, respondents said that social media is potentially a good way to correct rumour but that this is a labour intensive endeavour. There were also exchanges proposing that the NHS could approach social media providers to ask them if they would verify and label trusted health-based accounts in times of a crisis, to ensure good quality and reliable information was identifiable.

However, there was a certain view organisations face major challenges, often in convincing senior management to see the value in social media. One problem identified was that some senior managers were not familiar with social networking sites, privately or professionally, leading to it being largely disregarded in the organisation's plans. In addition, David Foord (@dgfoord) Associate Director of Clinical Governance of NHS Direct suggested that managers' who are reluctant to join social media reflected their sense of risk, tweeting that "some snr mgrs need hard evidence B4 sign-up". Foord elaborated that organisations treat such decisions as a question of cost versus benefit in which justification of social media use depends on an "evidence-base that patients/public benefit outweighs resource input. Hard to persuade without such." However, a different user, @AgencyNurse, replied: "can we afford not to have a presence? Benefits outweigh cost .... & during emergency this will be tenfold," presumably displaying a sensibility to the large proportion of the general public who are increasingly turning to social media platforms to source up to date information. @Gemma_Finnegan suggested that pilot schemes to test the effectiveness of social media would be helpful for hospital trusts that are wary of possible risks. Indeed, practical application is necessary in order for organisations to learn how to engage with social media, and employ it effectively, rather than simply 'use' it. Unfortunately, certain users in our controlled discussion argued that acquiring funding for such schemes has been problematic.

Another issue discussed was how communications departments should manage social media during a crisis. There was a consensus that social media is a 24/7 communication medium, which requires around-the-clock monitoring, in order to stay engaged with the audience. Lack of staff resources was seen as an obstacle in making sure that health organisations can assert a consistent social media presence. Furthermore, other forms of media communications (press releases, press conferences, and telephone lines) have traditionally been seen by organisations as a higher priority, resulting in engagement through social media channels being neglected.

Jordan-Meier (2012) claims that the culture of an organisation will determine its approach to social media and stresses the need for a multilateral social media strategy: "For many organizations, monitoring and analyzing social media is the domain of the marketing department and not business continuity or risk management. Culture, silos and turf wars can get in the way of effective use of social media monitoring. The fact is that effective utilization of social media in a crisis requires a multi-disciplinary approach. The marketers, the communicators, the planners, the lawyers, the programmers — they all need to come together to create a culture of trust, collaboration, cooperation and sharing to create a communication monitoring model that works." (Jordan-Meier, 2012, para.9) Searching for health information online has also become more popular amongst the public, with 71 per cent of U.K. respondents in 2011 saying they do so 'more than never' as opposed to 37 per cent in 2005. However, health information is searched for on the internet as much as 17 per cent less than other forms of information such as travel planning or information about local events. (Dutton and Blank, 2011, p.23) This disparity may suggests that public users, who are prepared to search for a lot of information online, lack confidence in the channels or platforms which disseminate health information, or that users are unaware of platforms available to them. Conversely, this may also suggest that the existing platforms (i.e. websites and social media devoted to health) are inadequate in number, or in their capacity to engage users.

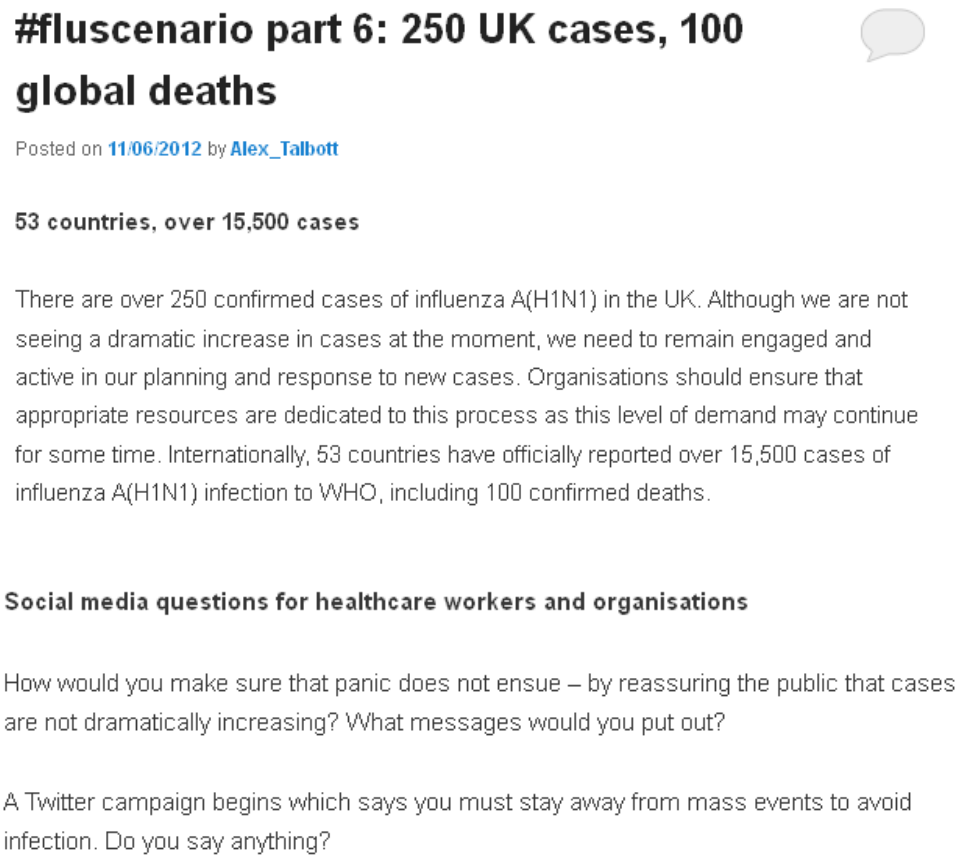
Creating a more personalised tone on social media can help organisations in spreading their messages more effectively, as well as recruiting key individuals associated with an organisation to help disseminate useful information and resources. For example, a personal tone was been struck by accompanying ECDC's own Twitter page with an additional account by director Mark Spranger, which put a human face to the organisation and crisis response. Also, in a video interview with doctors.net.uk Clare Gerada, the Chair of

Council of the Royal College of General Practitioners, said that she wished that she could disseminate advice over Twitter during the 2009 flu pandemic. (Gerada, 2012) Similarly, participants in our online discussion suggested that healthcare professionals should be allowed to communicate with the public during a crisis in right context and within agreed guidelines. However, it was noted that healthcare professionals should also recognise that they are professionally accountable and should be clear about their sources and the reliability of the information they pass on to the public. Due to complications of misinterpretation, it is perhaps understandable that media communication during a crisis is largely managed by a centralised communications department. However, the generalised information posted by most public health authorities displays little interaction with users needs. These limitations suggest that although some public health authorities have begun to partake in social media, some fail to engage with users on a discursive basis. One study in Finland found that online communications by public health authorities during the 2009 H1N1 pandemic was unsuccessful because there was a lack of common language or proper dialogue between experts and users. Authorities arrived late to emerging online discussions and were unable to assert a presence. Research shows that even on social media experts speak with technical and scientific terms, whereas citizens perceive risks and crisis more emotionally (Tirkkonen & Luoma-aho, 2011) Rather than completely individualised social media accounts, this is a good example of how organisations could focus on employing spokespeople to communicate in an appropriate tone on social media sites, building a personable presence to help humanise the communications process.

There was a strong consensus in the @nhssm discussion that a strong online following and sense of community must be built prior to an outbreak. @Sasha_Taylor gave advice to “get SM in place during quiet times, build an audience that trust your info, engage in timely manner.” This was supported by @DavidWaldock who said, ”You'll get a core following who trust you and will act as pointers to others; during the event is too late to engage.” It is unlikely that every crisis organisation could acquire an extensive following in advance of an outbreak because the nature of crises is unforeseeable. A topic cannot be trending before it becomes relevant. Nevertheless, it would appear sensible for organisations to aim to nurture a core of general followers prior to a crisis, constructing a reliable, personable online reputation that is supplemented by its offline status. The organisation would then be able to activate this digital social capital to tap into an emerging trend and respond accordingly. In a crisis, the sudden influx of concerned users may be guided towards the organisation as a trusted voice if the alerts disseminated are appropriately adapted to the immediate situation, and if the existing core followers are encouraged to endorse and repost the messages from the organisation’s account.

6.5 @nhssm chat B: #fluscenario

In preparation for our second @nhssm chat (B), we organised a #fluscenario blog. (@nhssm, 2012b) The purpose of this was to post one blog per day for one week about an emerging, but hypothetical influenza A(H1N1) outbreak. It was envisaged that @nhssm followers would read the blog each day and respond to a series of attached questions about how they might react on social media platforms. The full #fluscenario is in Appendix II. Here is one example of a post and accompanying questions:



#fluscenario part 6: 250 UK cases, 100 global deaths

Posted on 11/06/2012 by Alex_Talbott

53 countries, over 15,500 cases

There are over 250 confirmed cases of influenza A(H1N1) in the UK. Although we are not seeing a dramatic increase in cases at the moment, we need to remain engaged and active in our planning and response to new cases. Organisations should ensure that appropriate resources are dedicated to this process as this level of demand may continue for some time. Internationally, 53 countries have officially reported over 15,500 cases of influenza A(H1N1) infection to WHO, including 100 confirmed deaths.

Social media questions for healthcare workers and organisations

How would you make sure that panic does not ensue – by reassuring the public that cases are not dramatically increasing? What messages would you put out?

A Twitter campaign begins which says you must stay away from mass events to avoid infection. Do you say anything?

Figure 15. Extract from @nhssm and BMJ #fluscenario blog. Day 6: 250 UK cases, 100 global deaths (@nhssm, 2012b). Retrieved from http://nhssm.org.uk/fluscenario-part-6-250-uk-cases-100-global-deaths/

Overall, there was a general consensus, as before, that social media could be used collaboratively by health authorities and healthcare professionals to combat rumour. @colinwren said that this partnership could act together to flood social media channels with authoritative sources. In addition, @Gemma_Finnegan said that a good way to quash rumour would be to develop a list of trusted sources and friends on Twitter that already have large followings to counteract misinformation. The discussants from the previous @nhssm discussion on emergency planning also said that more preparation was required to increase collaboration between organisations offline as well as online, with part of the aim being to establish a strong social media presence that the public could trust. @a_double_tt reflected the need for more to be done in terms of collaboration in order to formulate a robust response of social media during public health crises: “I know I and the org I work for have a lot of networking 2 do”. Currently, a cross-organisation emergency communications plan does not exist, either in the U.K. itself, or in Europe. This may well be due to the fact that such an effort would be difficult to coordinate, or because agencies remain preoccupied with regional priorities when planning for an emergency. Nevertheless, collaboration online would be suited to the barrier-less nature of social media and would not necessarily be difficult to implement. Key organisations should make themselves known to each other and form an alliance in order to coordinate consistent and authoritative responses during a crisis.

6.6 Conclusion

Ensuring that health organisations gain stature and authority on social media sites is a first step towards the better dissemination and collection of critical information during crises, and could further authorities' power combat viral rumours that have proved damaging to public opinion in recent outbreaks. Organisations should aim to build a social media presence before a crisis happens by keeping members of a community regularly informed of what it is involved in, as well as providing advice on protective behaviours. It may also be worthwhile nominating several people within the organisation to have access to the social media accounts to help monitor and respond to comments. However, whilst organisations can build up a presence prior to a crisis, it is also important for organisations to proactively monitor the trends across social media sites as they happen to ensure that they are aware of the key issues as they emerge and have a voice in conversations early on.

Expert advice and information is crucial, and Waldock claims that "the expert's opinion is highlighted by other agents (for example, retweeted or shared on Facebook) if it is considered to be accurate and relevant for a particular group, challenged if inaccurate and ignored if irrelevant." (2012, p.15) Organisations could recruit authoritative individuals associated with the organisation to help spread information in a more personal and informal way. Of course, it would be helpful if individual healthcare professionals amplified useful public health messages on social media during a crisis and this could add extra authority to a particular message. However, currently it is debatable whether individual healthcare professionals can be relied upon to consistently disseminate public health messages during a crisis. Some may feel compelled to share on some occasions but only if they are supplied with reliable information they can trust, so they do not risk patient safety or their own reputation. For healthcare professionals to feel comfortable using social media during a crisis, they need to know that their employer has sanctioned its use and also be in possession of verified information that they can pass on. Organisational buy-in is crucial if social media is to be adopted as a serious crisis communications tool. To help assess its benefits organisations might want to do more around analysing the types of messages being shared on social media sites in order to quantify real needs being expressed, which then might provide a more robust basis for integrating it into communication strategies. Therefore, it is important that the value of social media is properly quantified and integrated into a strategic approach at an organisational level before healthcare professionals are encouraged to use it as a means to spread public health messages.

7. Social Network Analysis

The value of social media is continually being debated by companies and organisations around the world. It has been calculated that Coca-cola now spends 20% of its marketing budget on social media platforms (Ignatius, 2011) and corporate brands utilise social media to not only promote their products but to influence the direction of conversations to find out more about their customers or fans. (Miller Cain, 2009) In response to this, Morozov writes: "conversations about more serious topics (like pandemics- and their tragic consequences) could be shaped as well." (2009, para.10) Is there a way health organisations could analyse and utilise data deposited on social media platforms during public health crises to detect and intercept trends early on?

7.1 Tracking contagion

Chew and Eysenbach's 2009 content analysis of tweets demonstrated the way in which sentiment can be tracked by analysing social media messages. However, studies have shown that by collecting (a.k.a "scraping" or "mining") messages posted on social media sites can also be used to track the spread of a disease. St Louis and Zorlu claim that "Patty Kostkova and her colleagues at City ehealth Research Centre, City University, London, showed that the 2009 H1N1 flu outbreak could have been identified on Twitter one week before it emerged in official records from general practitioner reports." (St Louis & Zorlu, 2012, para.8) Likewise, during the first hundred days of the Haiti earthquake researchers collected online sources from the web, including news articles, blogs and Twitter posts. They matched the volume of cholera-related mentions with traditional epidemiological reports and discovered that "Trends in volume of informal sources significantly correlated in time with official case data and was available up to 2 weeks earlier." (Chunara , Andrews, & Brownstein, 2012, p.39)

The work of Nicholas Christakis in social networking analysis (SNA) has shown that by analysing how networks are constructed can provide a basis for predicting emerging trends before they escalate. By mapping a population as a web of nodes (which represent people), then tracking the epidemic's antecedent progress amongst the group of most connected individuals or nodes, Christakis claims SNA can make projections about the spread of an outbreak among the general population. This methodology could conceivably be applied to predicting the progress of epidemics in advance, and could be useful in planning crisis relief efforts such as vaccination. In a TED talk (Christakis, 2010), Christakis begins by talking about the curve of adoption, where the spread of a communicable thing, such as an idea, a behaviour, or in this case a contagion begins with a small percentage of adoption, increasing as time goes on. The rate of adoption however, does not simply reflect a series of random contractions; rather, Christakis claims that the spread of a contagion depends on the nature of the network it is spreading through. The way a contagion spreads, for example, will depend on who is connected to whom, and on the nature of these relationships, and the degree of an individual's connectedness will vary from person to person.

Looking at the screenshot below (Fig.16), he claims that if a contagion was spreading, it would be better to be an associate of node B on the periphery of the network, because it is less connected, and therefore at a lower risk, than node A. A's higher 'degree' of connectedness, and position in the core network, makes it more likely to contract, or adopt, the contagion at an earlier stage than the rest of the network. If identified earlier on, well-connected nodes like A could be isolated and monitored and Christakis argues that by identifying the progress of an outbreak among this well-connected group early on, projections can be made, and appropriate interventions can be planned to curb the prevalence of general infection.

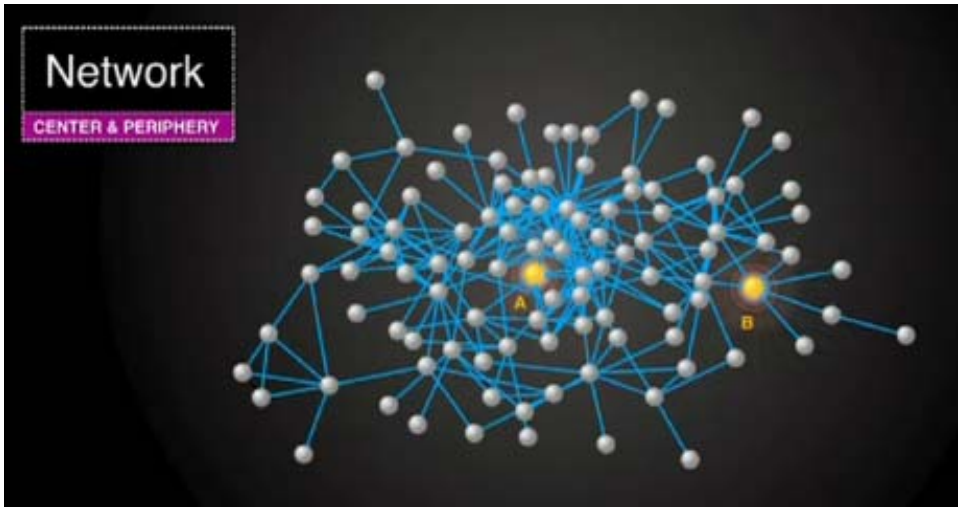


Figure 16. Connectedness of nodes in a network. With permission from Christakis, N. Screenshot taken from *How social networks predict epidemics*. Christakis, N. (2010) (5 minutes, 12 seconds) Retrieved from http://www.ted.com/talks/nicholas_christakis_how_social_networks_predict_epidemics.html

Christakis draws upon one example of where he took 1,300 randomly selected undergraduates at Harvard and had them nominate their friends during the 2009 H1N1 outbreak. The nominated friends were, by extension, initially better connected than the randomly selected individuals. He then monitored the most-connected nodes and the general random sample separately to see if they presented influenza-like symptoms. Analysis of the cohort of most-connected friends was able to alert researchers to the emerging prevalence of the disease sixteen days in advance of when it reached its peak in the general student population. The graph below (Fig.17) shows that the spread of the disease amongst the nominated friends group (yellow) happened much sooner than the randomly selected participants (red). Christakis proposes that these results show that we could potentially predict an impending epidemic peak as much as 46 days in advance.

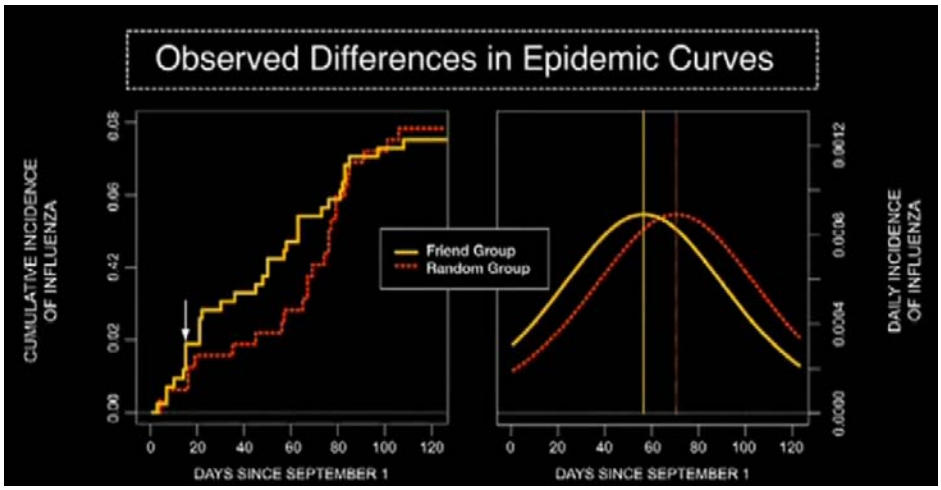


Figure 17. Spread of contagion comparison between randomly selected individuals and nominated friend group. With permission from Christakis, N under the Creative Commons license. Screenshot taken from *How social networks predict epidemics*. Christakis, N. (2010) (9 minutes, 35 seconds). Originally cited in *Social Network Sensors for Early Detection of Contagious Outbreaks,* Christakis, N., Fowler, JH. *PLoS ONE,* 5(9), p.4, Fig.3. Retrieved from http://www.ted.com/talks/nicholas_christakis_how_social_networks_predict_epidemics.html

In terms of effectively targeting interventions, Christakis claims that while randomly selecting 30% of the population to be vaccinated would not create herd immunity, but proposes that if the same random 30% sample of the population was selected but nominated their friends, a much higher population immunity would be acquired (up to 96% of the population) (Christakis, 2010). If this proved effective, it could potentially stop an epidemic early in its tracks.

7.2 Intercepting contagion

Christakis also claims that today we have access to masses of data that could be utilised to understand how people are connected. Mobile phone networks or social networking sites could give us insights: "these new technologies not only tell us who is talking to whom, but where everyone is and what they're thinking based on what they're uploading on the internet." (Christakis, 2010) He calls this movement 'computational social science' which allows us to use data to understand networks in causation and adoption of trends. This administrative data could be used to get a better understanding of the processes behind human behaviour. One of the suggestions from the second @nhssm discussion we conducted was that organisations could do more to 'seed' messages with highly connected people within the social network to ensure messages would have the best chance of reaching as many people as possible. If key miscommunication points could be identified, then influential users could be mobilised to spread balanced opinion or trustworthy information earlier on. This depends on analysts' ability to identify the best connected nodes in a network, even on a small scale. Success in this method has already been seen in a study where a series of SNA cue questions were used by nurses to interview patients and 'map' relationships, reducing the spread of syphilis within a local community. (Ogilvie, 2005)

The ability to track peoples' whereabouts and connections within a network could have massive implications for detecting both a virus and intercepting it early, but could also be applied to in understanding how messages can be spread by highly connected individuals within a larger network. Palen claims that the use of global positioning systems (GPS) could be harnessed "In a future in which nearly everyone will have a GPS-enabled camera phone in their pockets, the creation of information and its easy dissemination requires conscious incorporation of citizens-as-participants in managing emergencies." (Palen, Hiltz & Liu, 2005, p.57) However, there are concerns about obtaining this data and privacy issues would need to be protected and consent obtained ethically.

Network analysis tools to track disease accurately can be expensive to purchase (although free versions exist) and organisations interested in incorporating this type of data analysis into their overall investigations will want to be certain that these new tools will be just as accurate and cost-effective as current 'gold standard' methods, particularly in epidemiological surveillance. Furthermore, to assess and utilise this data for effectively, sophisticated semantic processing software is required to interpret the meaning of content, as well as individuals who can interpret this data for public health purposes. Whilst the there are foreseeable problems in tracking the nature of an epidemic solely through social media—such as self-reporting of symptoms on social media being exaggerated, misdiagnosed, or incomplete–further research is yet to be done to properly assess the value of this data. Nevertheless, users of social media remain a relatively untapped resource that can indicate opinions, symptoms and data about a virus, which should be investigated and analysed in more depth when formulating crisis communication strategies.

8. Conclusion

This report has outlined the opportunities and challenges presented by the use of social media as a crisis communications tool. Social media is the latest vehicle to allow humans to collaborate and share information in the midst of a developing crisis, in order to achieve the mutual goal of survival.

Additionally, the growing trend in users visiting social media sites to find out about the latest news is changing the ways that the public consume and process news. The participatory culture of the social web means that users are both content creators and active information seekers. Social media is built on the principle of user-generated content, which means that users can now contribute towards the collective body of information and knowledge developed during a crisis. This activity can be of use to authorities involved in crisis communication because it can alert them to concerns or misinformation expressed on social media platforms and can help them prepare responses that reflect visible and quantifiable information needs. Furthermore, social media also appears to encourage prosocial behaviour, which means that the medium often compels users to share useful information and resources with each other. This has the potential to be an important asset for those involved in crisis communication and the promotion of protective behaviours.

Whilst uncertainty is an inevitable aspect of crisis situations, users themselves now employ social media to collect and cross-verify information from a variety of sources, in order to make informed decisions and understand risk. Therefore, it is important for health authorities and other organisations to have a strong presence on relevant social media platforms in order to establish authority in crisis discourses as early as possible. Risk and panic is heightened when there is a scarcity of information available and public health organisations could allay fears on social media sites by proactively intercepting concerns early on. Organisations are unable to control all content discussed on social media sites, but it is important for them to assert their presence and remain in tune with public sentiment. Users of social media rely on other users to help corroborate sources, but as this report demonstrates good quality information from expert or official sources carry considerable influence on social media sites, especially during times when information verification is crucial, such a public health crisis.

Individual organisations will have their own priorities but a collective effort between organisational stakeholders involved in crisis communication in identifying key partnerships on social media would be highly beneficial in terms of making sure that good quality information spreads quickly and unhelpful information is tackled early on. As well as setting up organisational accounts to disseminate information, organisations could also identify the most connected individuals within their social network and ask them to help spread a particular message or resource more widely. If a sense of online community can be built between the public before a crisis happens, an organisation has the potential to efficiently amplify its message more widely, as key followers repost or retweet alerts to their own followers. Also, when communicating through social media sites in crises, organisations should be aware of what discussions are trending or a generating the most comments in real-time and should aim to respond to the public in a personable tone, signposting them to helpful information and resources. The decentralised and ephemeral nature of information exchange on social media means that communications plans need to adapt to the changing information needs of the community, which can in some cases change on an hourly basis.

For some organisations that are wary about using social media as a communications tool there are ways in which networks and the messages shared on them can be analysed in order to plan an evidence-based response to a crisis. For example, Chew and Eysenbach's study (2010) showed that there are ways of analysing sentiment displayed on social media by categorising the context of messages shared. If

organisations could analyse and interpret sentiment in real-time, then information needs or misinformation could be responded to with more accurate forms of communication. Furthermore, it would be interesting to understand what proportion of content being produced on social media is original user-generated content and how much is influenced by other media channels, such as television, radio and newspapers. Similarly, Christakis's work (2010) on Social Network Analysis (SNA) shows the potential of how analysing and identifying the people and their connections within a network, could lead to prevention strategies which limit the spread of any potentially harmful contagion, be it a disease or misinformation. This report recommends that organisations involved in crisis communication should carry out more research into the dynamics that govern social networks and the quality of the content posted on them in order to develop transparent communication strategies that are data driven and evidence based.

This report has largely focused on the uses of Facebook and Twitter in crisis communication. Primary focus has been on Twitter because much of the published case studies about use of social media during epidemics have been written on this particular medium. Reasons for this are likely to be because of the relative openness of the network, which under its terms and conditions, has made it easier for researchers to access, analyse and quantify messages shared. However, as the beginning of the report shows, there is regional variation in the uptake of social media and the different networks that nationalities prefer. A one size fits all approach will not be appropriate and it is important for those involved in crisis communication to choose the most suitable forms of social media to establish a presence on. This report did not intend to provide an exhaustive analysis of all social networks available but sought to highlight overarching features that are intrinsic in most social media sites and to demonstrate how they have been and can be used by crisis communicators. Table 1 outlines some key best practice principles, which can be applied when planning social media communications before and during crisis.

In conclusion, social media facilitates the process of democratic and transparent exchange of knowledge during public health crises, and its multitasking platforms encourage users to rapidly cross-reference and filter information from a variety of sources. It is very important for organisations involved in crisis communication to monitor and have a stake in these exchanges in order to assert their authority with resources and information that help the public make informed decisions and interpret risk. There are some examples of how social media has been used in previous emergencies to engage the public and spread helpful information, but generally speaking, it has been applied in an inconsistent manner. Furthermore, to ensure that social media platforms are harnessed to their fullest potential, organisations should do more to monitor and analyse the sentiment and messages that users share to help formulate outbreak communications that are relevant, timely and transparent.

Table 1. Key recommendations when adopting social media as a crisis communications tool

- Identify the social networks that are most relevant to your intended audience
- Ensure your social media strategy ties in with your organisation's communications objectives and wider strategic aims
- Identify several trusted individuals in your organisation to permit access to your social media sites, to help spread the workload
- Identify key members of the organisation (those associated with the organisation or those who are well connected) to post messages in a personal capacity in order to help amplify your message
- Ensure that a presence is built and maintained on social media sites before a crisis. Building a community presence is important to make sure that you are known as an authoritative and trustworthy source of information in advance
- In order to establish a loyal community, provide regular updates about your organisation's work and respond to your community's questions or concerns
- Identify other organisations involved in crisis communication and develop partnerships with them, in order to spread consistent messages and work together to challenge misinformation
- Use your community as an information source. Ask them questions about their experiences or concerns. Social media is a two-way communications medium and the public could prove to be an invaluable source of information.
- During crises, monitor trending topics as they happen and make sure you have a stake in the conversation early on, by posting authoritative information that contains links to further useful resources
- Try not to be overly didactic in tone, but seek to strike a consistent balance between authoritative and personable
- Clearly communicate risk. Help users gain a better understanding of the level of risk to themselves and those in their online and offline networks
- Demonstrate you are listening to your users by regularly responding to their concerns
- Make it easy for users to share content on your website with their own networks by adding social media sharing buttons
- Do not confine your communications to just one social media platform. Some social media sites are liable to crashing due to high usage and it is important to ensure your message reaches as many people as possible
- However, if using multiple platforms, be consistent in the messages and information you convey
- Seek to develop resources adapted to a variety of media (factsheets, news reports, blogs, podcasts, videos)

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10.Appendices

Appendix 1. Social Networking Sites for Health Professionals

Popular Social Networking Sites for Healthcare Professionals		
Name	**Region**	**Description**
MedicalMingle	U.S.-dominated	A free professional social network, primarily used as a 'job board'. Medical Mingle offers blogging, job postings, and career resources for people interested in, working in, servicing, or studying for a career in the healthcare and medical field.
Sermo	U.S.-dominated	Allows physicians to share clinical information and case studies in a confidential environment, and to earn honoraria for frequent input. Sermo is free to join and its own site states that it has 125,000 physician members across 68 specialties.
BioMedExperts	International	A publication-based scientific social network that allows researchers to collaborate virtually, in order to increase biomedical research. It involves more than 3,500 institutions in more than 190 countries. BioMedExperts maps cities where each author has publications and cities where co-authors of each author have publications, to encourage collaboration. It is free to register.
Esanum	Country-specific sites in Germany, Spain, Italy, Austria, Switzerland	Only for licensed physicians, claims to have more than 42,000 registered members.
DocCheck	International & country-specific versions in Germany, France, Spain and Italy	A SSO (single sign on) community which is free to join, allowing members to use one password to confirm that they are indeed a professional physician in order to browse academic sites usually requiring access codes. The site claims to have over 800,000 members in Europe, more than 25,000 members in France alone. Emphasises altruism and support by encouraging members to ask each other questions as 'colleagues'.
Doctors.net.uk	U.K.-dominated	Hosts discussions in forums and provides real-time health news to members. Claims to 'tailor' information to each user based on their interests/credentials. Over 190,000 current members. Free to access, but Doctors must provide their GMC registration details and Medical Students must provide proof of their medical course. Users have the opportunity to gain electronic Surfing Rewards (eSR) which can be exchanged for products and high street vouchers. Doctors.net.uk uses Twitter and Facebook to broadcast health news and trending discussions in real-time.
Doc2doc	International	BMJ Group's online doctors forum. It is primarily used as a space for doctors to discuss clinical topics, as well as recent health news. It currently has 70,000 registered members and a strong following on Twitter.
Doctors Hangout	International	A social networking site for doctors and medical students which has gained popularity in the EU and ROW, particularly in India. It enables members to connect with each other socially and professionally by aligning their hobbies and subspecialities.

LinkedIn	International	LinkedIn is used by many healthcare professionals to search for jobs and increasingly for recruitment. 129,013 LinkedIn users have listed themselves under "Medical Practice" in the US, with an additional 50,000 international members in this category. 322,158 users are listed under "Hospital and Health Care" in the US, plus another 100,000 international members in this category. Through the 'Groups directory', members can join groups such as the 'Healthcare Physicians Practice Network'.
Coliquio	Germany-dominated	Exclusive to medical practitioners. A professional networking platform is used by approximately 60,000 doctors and clinicians and to be growing by 2,200 new registered users every month. Coliquio claims to offer dialogue, exchange and interaction in clinical and non-clinical forums, treatment guidelines, certified educational resources and the latest medical news.
Réseau Santé Social (RSS)	France	The RSS was set up in 1998 to advance the use of technology by French healthcare professionals and general practices. Members pay subscriptions of between 8 to 30 Euros per month depending on the level of RSS services they desire. The RSS sells hardware for setting up internet connections, as well as providing its internet members with real-time health news and maps, crisis alerts (from the Direction générale de la santé via the DGS-ECHO system), E-mail, organisational, and career-oriented tools. It also provides a secure service to digitise and store patient records online (in connection with the electronic 'Carte Vitale' social security system in France). It boasts over 50,000 full members since 2004.

Appendix 2: BMJ and @nhssm #fluscenario blog (Chat B)

The BMJ and #nhssm team up to run a #fluscenario

Posted on 01/06/2012 by Alex_Talbott

#nhssm and the BMJ have teamed up to get your views and case studies on communications during a flu pandemic. This partnership is another notch on the #nhssm community's bed post (so to speak!) and is only possible because of the dedication shown by you all when you join in the Wednesday chat and use the hashtag throughout the week. A big thanks to you all from Alex, Colin and Gemma!

European Commission research project

The BMJ Group are part of a European Commission research project called TELL ME, which is reviewing previous communication techniques used during public health crises and will be developing an evidence-based behavioural and communication package to respond to major epidemic outbreaks, notably flu pandemics.

doc2doc (the BMJ's online fora space) is responsible for writing a report on how social media has been used to spread reliable and timely information to at-risk groups in previous epidemics, as well as put forward recommendations for best practice for the future.

They approached the #nhssm team a couple of months ago about holding a couple of chats on the subject and we of course leapt at the chance. We would like to explore whether the interactive nature of social media genuinely changes the way in which we exchange and share health messages and what role health professionals, health organisations, the media and public sector bodies can play in disseminating real-time information during a flu pandemic.

To do this we are holding two chats over two weeks – here's our schedule:

Friday 01 June – Retrospective pandemic/emergency comms case studies published on the #nhssm blog.

Wednesday 06 June – #nhssm chat on previous use of social media in epidemics and best practice.

Thursday 07 June – Chat summary published.

Thursday 07 June – #fluscenario starts on the #nhssm blog (you'll have to wait and see what we have in store for you all, but we think it is pretty good!).

Wednesday 13 June – Scenario ends. #nhssm chat on the scenario, lessons learnt and work that should be done in future.

Thursday 14 June – Chat summary published.

We look forward to hearing your views and experiences in the chat on Wednesday 06 June. Do start a discussion in the doc2doc forum Going Viral if you have any further comments.

#fluscenario part 1: Intro and background to the scenario

Posted on 07/06/2012 by Alex_Talbott

This is the first part of our #fluscenario – a partnership with the BMJ. You can read more about the aims and reasons behind #fluscenario in our 'The BMJ and #nhssm team up to run a #fluscenario' post.

Please remember that this is an exercise and while based on events in 2009 it is not happening now.

Intro to exercises

Exercises are regularly used in emergency planning as a way to practice responses and improve plans. Part of this involves using a realistic scenario against which organisations and individuals' responses can be tested. In order to see how social media might be used during an infectious disease epidemic, we are using a scenario based on the 2009 influenza pandemic. All of the events are based on what happened in 2009, however the timescale has been compressed.

This scenario will run over the next six days and culminate with the #nhssm chat on Wednesday 13 June (8-9pm).

Please bare in mind it is important that if you tweet about the blog posts that are part of this scenario you make it clear this is a scenario and is not real. We're using #fluscenario to hopefully make this easy for everyone.

Background to the scenario

The 2007 Department of Health (DH) pandemic influenza framework saw the start of a period of concentrated planning in the UK in preparation for a future pandemic (this has now been updated with the DH publication The UK Influenza Preparedness Strategy 2011).

The world had been in WHO Phase 3 for a number of years in response to the emergence of avian influenza A/H5N1. UK planning had largely focussed on the reasonable worst case scenario. It was anticipated that the next pandemic virus would originate in South East Asia, the Middle East or Africa, and that the most likely candidate would be a virus of avian origin, either directly infecting humans or developing the ability to do so through infection in pigs or another mammalian host.

It was expected that the new pandemic virus would take two to four weeks to reach the UK from the source country, and that once here major population centres would be affected within 14 days. Pandemic activity was expected to last for three to five months from arrival of the virus in the UK, with possible subsequent waves occurring weeks or months later.

Scenario modelling

Modelling assumptions predicted that numbers of pandemic influenza cases would peak around 50 days after the virus reached the UK, and it was predicted that a larger proportion of the population (including those not normally affected by influenza – i.e. fit and healthy young adults) would become more ill than is normally seen with seasonal influenza.

Modelling also suggested that up to 50% of the population might be ill over the duration of the pandemic, that any second wave could be more severe than the first. Up to 4% of symptomatic patients could require hospitalisation, with 25% of these (1% of cases) requiring critical care.

Mortality was expected to be greater than in inter-pandemic years, with a potential maximum case fatality rate of 2.5% anything from 55,500 to 750,000 excess deaths were predicted across the UK. The normal number of deaths from flu in the UK is 8,000-12,000 a year.

Media

A number of papers have run stories over the past month on the possibility of pandemic flu hitting the UK. Many have concentrated on the South East Asian poultry industry and its workers. Few stories in mainstream media detail the symptoms of pandemic flu beyond 'most live, others die' type reporting.

Social media questions for healthcare workers and organisations

Pandemic flu is being planned for at a national level. What could you be doing now to help you, your followers and organisation if pandemic flu were to reach the UK? What networks are you part of that may help spread the correct information?

What accounts, organisations or individuals would you trust? Would you be happy to discuss over social networks with other HCPs or would you prefer a closed forum? How would you ensure reliable information?

#fluscenario part 2: Overnight update

Posted on 08/06/2012 by Alex_Talbott

Good morning. Today sees the start of the #fluscenario based on the 2009 pandemic in the UK. Remember that although these are real events that happened in 2009, these are not actually happening now – remember this if you retweet it as we don't want to start a panic!

A number of human cases of swine flu A/H1N1 have been reported in Mexico and the US (California and Texas) including some fatalities. WHO is coordinating the global response and is monitoring the threat of an influenza pandemic. We remain at WHO Pandemic Alert Phase 3.

#fluscenario part 3: Swine flu reaches the UK

Posted on 08/06/2012 by Alex_Talbott

Human cases of swine influenza A/H1N1 have been reported in many countries including the UK (Scotland). WHO has raised the pandemic alert level to Phase 4. This indicates that the likelihood of a pandemic has increased, but not that a pandemic is inevitable.

Two people admitted to a Scottish hospital after returning from Mexico have been confirmed as having swine influenza A(H1N1). Both patients, a man and a woman, are recovering. Seven people who have been in contact with them are displaying mild symptoms. Other cases are being investigated. The Foreign and Commonwealth Office has advised against travel to Mexico.

Media

The papers, TV news and websites are all reporting on the chance of a pandemic severely hitting the UK. Many are concentrating on the travel link to flu at present. Symptoms are being clearly reported but there is some confusion as to which groups of people are at-risk and there is a feeling that the pandemic (if it comes) won't be too deadly.

Social media platforms are awash with a variety of true and false information about swine flu.

Life at present is not overly affected and the DH are emphasising that the public should continue about their normal lives.

The 'Catch it. Bin it. Kill it.' campaign is being rolled out across the nation. The press are expected to report on it soon.

Social media questions for healthcare workers and organisations

Where can you get up-to-date information on the pandemic? How are you going to ensure that your messages are consistent with those from other national, regional and local bodies? Which organisations in your locality can you partner with to ensure the message spread as far as possible?

What resources are you able to put to answering your public's questions? How are you going to match your online messages with your traditional comms messages? Who in your organisation or personal network would make a good spokesperson for a YouTube video?

Do we need to make a distinction between what types of messages a doctor would tweet from their own account versus an organisation's strategy? What is acceptable to retweet?

How can you ensure you link in with healthcare professionals and organisations from across the EU and the rest of the world on social media?

Would you send out 'blanket' tweets or info addressing concerns of patients or would you try to address them individually? How would you include them in comms?

#fluscenario part 4: Cases confirmed across the world

Posted on 09/06/2012 by Alex_Talbott

Cases confirmed across the world

Cases have been confirmed in Mexico, the USA, Canada, Spain, New Zealand and Israel; while other countries are reporting suspect cases. WHO has announced Phase 5. A pandemic has not yet been declared.

There are now five confirmed cases in the UK. Further individuals are being investigated and there are also large numbers of suspect cases and 'worried well' patients.

GPs are worried that they will be over capacity with patients as the media ramp up their coverage of the continuing story.

Media

All media outlets are covering swine flu. Social media platforms are awash with a variety of true and false information about it.

Social media questions for healthcare workers and organisations

How would you scotch a rumour, tackle erroneous or questionable tweets or trending topics?

How would you assess a tweet from a Twitter account which presents themselves as a doctor and has viable information but you are not sure of their credibility?

As a healthcare professional are you negligent if you do not address false information or decide not to engage with patients on social media?

How can you ensure you link in with healthcare professionals and organisations from across the EU and the rest of the world on social media?

#fluscenario part 5: School shuts, telephone line opened, antivirals deployed

Posted on 10/06/2012 by Alex_Talbott

Evolving situation

Although WHO has not yet declared a pandemic, internationally, eleven countries have officially reported 257 cases of influenza A(H1N1) infection. In addition to the UK cases, cases have been confirmed in Austria, Canada, Germany, Israel, Mexico, Netherlands, New Zealand, Spain, Switzerland and the USA. Other countries are reporting suspect cases. There are now eight confirmed cases in the UK. Further individuals are being investigated and will be confirmed (or not) as having A(H1N1) infection by the Health Protection Agency as soon as possible.

Human-to-human transmission

The first case of human-to-human onward transmission has been confirmed in England. This occurred between a returned traveller from Mexico and a close contact. This is not unexpected and has already been reported in other affected countries, including Scotland. The close contact has been offered antivirals as a precautionary measure. These two cases of human to human transmission in the UK does not yet represent sustained human to human transmission. The risk to the general public is still very low.

School shut

The first cases of swine flu in school children have been reported in a school in south west London. These are children who have recently returned from a school trip to Mexico. They are responding to treatment, and their close contacts have been given antivirals as a precaution. The HPA has advised the school to close as a temporary precaution for five days.

Swine flu information line set up and antivirals deployed

People returning from affected areas who become unwell within seven days of their return should stay at home and contact their GP or NHS Direct. Individuals will be assessed and, if necessary, testing and treatment will be provided. DH has also set up a swine flu information line for the public on 0800 1513513.

In order to support the UK health preparations and local response, DH is deploying the national stockpile of influenza antivirals to PCTs across the country. PCTs will receive amounts of antivirals based on their population sizes.

The Secretary of State for Health announced yesterday that frontline healthcare workers should receive antiviral drugs in advance of the distribution arrangements being set up. DHs current view is that this should only be used by healthcare workers if they start to develop symptoms.

Media

The media are turning from reporting the world-wide status of the virus to seeing how the UK is coping and what plans are in place to help the public. Stories of GPs misdiagnosing swine flu are around and there is increasing confusion as to which patient groups are at greatest risk, and what to do if you or a loved one fall into one such group.

Some GPs have taken to Twitter to complain that the DH is not doing enough to keep them in the loop. This has placed extra strain on the DH's media and digital teams.

Other GPs are helping to spread the message of what the symptoms are and how to prevent and/or treat them.

Social media questions for healthcare workers and organisations

Which journalists and media outlets are you connected to online? How can you influence the news content with your personal and or organisational online presences?

How are you going to promote the DH swine flu info line to the public?

What information would you need from the DH during the pandemic?

#fluscenario part 6: 250 UK cases, 100 global deaths

Posted on 11/06/2012 by Alex_Talbott

53 countries, over 15,500 cases

There are over 250 confirmed cases of influenza A(H1N1) in the UK. Although we are not seeing a dramatic increase in cases at the moment, we need to remain engaged and active in our planning and response to new cases. Organisations should ensure that appropriate resources are dedicated to this process as this level of demand may continue for some time. Internationally, 53 countries have officially reported over 15,500 cases of influenza A(H1N1) infection to WHO, including 100 confirmed deaths.

Vaccine being developed

A strain of the virus suitable for a vaccine has been produced and is being made available to the pharmaceutical industry and the network of global influenza laboratories. A vaccine should be available for use in the next few months. Face masks and other items of protective equipment are being supplied to healthcare workers caring for influenza patients from central government stockpiles. The Government is not currently advising the public to avoid of mass gatherings or social events (sporting events, concerts and

other public events). Officials across government are meeting regularly to discuss the developing situation with regard to the outbreak to ensure the country responds as well as possible.

The DH has started daily media briefings at Richmond House going through the latest swine flu numbers, deaths and expected scenarios for the coming weeks.

Remember, this is just a scenario based on the 2009 pandemic. This is not happening now.

Media

The 'Catch it. Bin it. Kill it.' campaign is in full swing and sales of alcohol gel and tissues are rocketing.

Social media questions for healthcare workers and organisations

How would you make sure that panic does not ensue – by reassuring the public that cases are not dramatically increasing? What messages would you put out?

A Twitter campaign begins which says you must stay away from mass events to avoid infection. Do you say anything?

#fluscenario part 7: 400 UK cases, nearly 20k internationally

Posted on 12/06/2012 by Alex_Talbott

First healthcare worker infected

There are now over 400 confirmed cases of influenza A(H1N1) in the UK. The first case of influenza A(H1N1) in a healthcare worker has been reported in Scotland. Some UK cases have been admitted to intensive care, including a pregnant woman. Globally, 66 countries have officially reported over 19,250 cases of influenza A(H1N1) infection to WHO. This includes 117 confirmed deaths.

Antivirals

DH has released national guidance which describes the process of antiviral assessment, authorisation and collection that will be enacted if required. This is intended to reduce the pressure on primary care and ensure everyone who needs antivirals can get them as quickly as possible.

It may be necessary to rapidly switch on local antiviral collection points (ACPs), for example if WHO officials declares a pandemic or the UK spread of the virus increases. It will take 24hrs for the amended legislation to be enacted therefore PCTs should have at least one ACP that can be activated within 24hrs.

Flu friends

DH is encouraging members of the public to identify 'Flu Friends' who can help if a person becomes ill. Flu friends could help by collecting medicines from local chemists, making sure the patient has all the food and liquid sustenance they need, and generally checking up on them to make sure the condition isn't worsening.

Remember, this is just a scenario based on the 2009 pandemic. This is not happening now.

Media

What is the local set up for getting hold of antivirals? How will you create easy to navigate and understand online content which outlines how members of the public can get the antivirals if they have symptoms?

#fluscenario part 8: Pandemic declared and first UK death

Posted on 13/06/2012 by Alex_Talbott

First pandemic of the 21st century

The UK response has moved from containment to mitigation, and has enabled the HPA to cease following up contacts and closing schools. To date there have been over 1,000 confirmed cases in the UK. The majority of UK cases have been mild, and associated with school outbreaks, consequently most cases have been children aged under 5 or aged 5-14.

Increasing numbers of patients are requiring critical care, however these have so far had underlying conditions associated with seasonal influenza such as chronic respiratory or heart conditions. Pregnant women and chronically obese patients are newly recognised risk groups for influenza due to this outbreak.

First death

The first death has now occurred in the UK. The patient had an underlying health condition, and had received care ion their local intensive care unit.

We expect the UK to move to the treatment phase of the response which will enable GPs to prescribe antivirals based on symptoms without a confirmatory test. Towards this, NHS Direct has confirmed readiness to activate the National Pandemic Flu Line if required to reduce pressure on GPs by enabling possible patients to be assessed over the phone or via the internet. If appropriate, patients will be allocated a unique number, which can be presented to an antiviral collection point and exchanged for a course of treatment.

Media

Media attention is turning to those at most risk and in ICU. The NHS is under strain in some places as ICUs receive higher numbers than normal of flu symptom patients.

Questions are being asked about the best use of the antiviral stocks with some media outlets suggesting members of the public are faking the symptoms in a bid to get the antivirals as they think they will protect them.

Social media questions for healthcare workers and organisations

What information are you making available online? Can journalists look at your Twitter feed for an update on the latest numbers of patients in ICU?

How would you address concerns on social networks about the risks posed to pregnant women? How would you reiterate that the pregnant woman that died had an underlying condition?

Would you try and educate the public about the possible side effects of the antivirals and re-iterate the message that they should only be taken when you have the symptoms of [swine] flu? If so how would you go about it?

#fluscenario part 9: ECMO machines hit the headlines

Posted on 13/06/2012 by Alex_Talbott

Intensive care

Larger than normal numbers of patients with influenza are requiring an additionally high level of intensive care. This is due to the impact of the virus on their lungs which is reducing their ability to adequately oxygenate the patients' blood.

Patients with known influenza risk conditions (such as heart or respiratory conditions) as well as those who have recently been identified as being at greater risk from this virus (e.g. the morbidly obese or pregnant women) and those with no known or recognised risk factors are requiring an extra level of care.

Swedish agreement

The specific treatment is termed ECMO (extra corporeal membrane oxygenation) and is a process whereby the patient's blood is pumped out of the body and oxygenated using a machine, before being returned to the patient's circulation. This is a highly skilled process and there are limited numbers of hospital beds in the UK where this treatment can be provided. The UK has a long-standing agreement with Sweden for extra capacity, and a UK patient has recently been flown there because all UK beds are currently full. The Department of Health is working with NHS hospitals to rapidly increase capacity in this country.

Media

ECMO machines are the story. Harrowing personal accounts of deaths from swine flu where the patient has not been put on an ECMO machine are being published across national, regional and local papers. Some families are calling for investigations amid claims that patients have died because they weren't offered ECMO treatment.

Patient confidentiality is stopping any detailed look (in the media) at whether or not the decision not to request ECMO treatment was merited or not. Medical experts have explained to the media that ECMO machines will not save everyone from swine flu and that as ECMO machines are a limited resource clinicians choose those patients that are most likely to respond to treatment. However, these messages are failing to hit home, especially in the regional media.

Social media questions for healthcare workers and organisations

How can you protect the NHS' reputation with regards to the ECMO stories? How can you describe the difficult decisions that are being made?

If you're a clinician can you help promote a clinical viewpoint of the ECMO story? What would you be comfortable saying in public about emotional stories such as pregnant patients that have died?