

Integrating Social Media Monitoring Into Public Health Emergency Response Operations

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ABSTRACT

Social media monitoring for public health emergency response and recovery is an essential response capability for any health department. The value of social media for emergency response lies not only in the capacity to rapidly communicate official and critical incident information, but as a rich source of incoming data that can be gathered to inform leadership decision-making. Social media monitoring is a function that can be formally integrated into the Incident Command System of any response agency. The approach to planning and required resources, such as staffing, logistics, and technology, is flexible and adaptable based on the needs of the agency and size and scope of the emergency. The New York City Department of Health and Mental Hygiene has successfully used its Social Media Monitoring Team during public health emergency responses and planned events including major Ebola and Legionnaires' disease responses. The concepts and implementations described can be applied by any agency, large or small, interested in building a social media monitoring capacity. (*Disaster Med Public Health Preparedness*. 2016;10:775-780)

Key Words: social media, public health, emergency response, Incident Command System

Monitoring social media as a source for real-time information is a critical Incident Command System (ICS) capability for public health emergency response and recovery. In recent years, social media has proven to be immensely valuable for the field of emergency management not only for rapidly communicating incident information to the public, but as a rich source of incoming information that can be gathered to immediately inform response and recovery operations. The definition of social media is broad but can be described as a website or application where users can share content in the form of text, picture, or video publicly or within a closed network. While social media growth continues, the landscape of social media platforms is continually changing, with new applications emerging frequently.

During an emergency, monitoring social media is a process of ongoing, systematic searches of social media websites for up-to-the-minute information on news or live events. This is accomplished by leveraging multiple tools (free or paid) to retrieve relevant incident content. By use of a combination of strategic keyword and geographical searches, social media information can provide ongoing understanding of on-the-ground activities, as well as gauge, and in some cases directly respond to, questions or criticism from the affected population. The focus can be narrowed to a few key platforms, particularly Twitter, Facebook,

and Instagram, which are currently the major real-time sources for incident-related activity in the United States.¹ Newer live-streaming applications, like Periscope, are adding even more ways to gain understanding of an evolving situation.

With more than half of US residents on social media, dedicating resources to social media during an emergency should no longer be considered optional, but rather as a critical operation to ensure the agency is aware of all potentially useful incident information as it occurs. One of the key benefits of social media monitoring is that the resources required to develop and mobilize a monitoring team do not require substantial funding. Rather, social media monitoring is an intensive human resources operation that can be accomplished by using internal staffing, external volunteers, or a combination of both. The New York City (NYC) Department of Health and Mental Hygiene (DOHMH) Social Media Monitoring Team (SMMT) was activated during emergency incidents in NYC, including 2 separate hepatitis A exposures in 2013, Ebola, a large mass prophylaxis full-scale exercise in 2014, a Legionnaires' disease outbreak in 2015, and Zika virus in 2016. In all of these incidents, the SMMT provided ICS leadership with awareness and information that informed operational decision-making. Responding organizations will have different informational needs depending on their responsibilities and objectives during an emergency.

Listed below are 3 key reasons for any response agency to monitor social media:

1. Situational Awareness

Situational awareness is the most important reason to have an established monitoring operation. Given the prevalence and continued growth of smart phones and social media, the public and news media now routinely provide pictures, video, commentary, and breaking news on developing situations 24 hours a day.² Having a mechanism in place to ensure relevant, timely, and accurate social media information is gathered and shared with agency leadership during an emergency will contribute to more informed decision-making. Whether a localized incident with specific geographic boundaries or a large regional public health emergency, there will be useful first-hand accounts, opinions, and misinformation shared on social media. This information is valuable whether the health agency is in a supportive role (eg, natural disaster) or in a lead role (eg, communicable disease outbreak). For example, after the NYC Ebola case was diagnosed on October 23, 2014, the SMMT was immediately aware when the name, background, and details of the patient's activities were leaked to the media.³ News organizations began reporting the name of the patient and inaccurately reporting his actions the day before hospitalization, such as the wrong bowling alley and trains he traveled on. This occurred in advance of the first press conference and allowed the DOHMH's Public Information Officer (PIO) to create talking points acknowledging public awareness and responding to the leak of personal health information.

2. Assessing the Success or Failure of Public Messaging

Social media is not only an effective communication method to reach large, diverse populations with emergency information, but also a useful platform for immediate feedback on public messages. During a rapidly evolving incident, clear, concise, and frequent public messages are critical. Actively monitoring outbound social media messages allows agency leadership, and particularly the PIO, to have a comprehensive understanding of how well or poorly official public messages are conveyed and interpreted. Inevitably, regardless of how well written the message, there will be further questions and potentially confusion. Paying attention to conversations stemming from press releases on social media informs preparation for the next set of communications to be released. Not only can the reach of the social media messages be measured, but there may also be trends of similar comments and questions that indicate what issues need further clarification in future messages. For example, during the 2015 Legionnaires' outbreak in the South Bronx, numerous questions persisted on Twitter about the safety of drinking water or visiting the area as well as if the disease was contagious. Although those questions were addressed initially, these comments displayed the importance of repeating the

same messages often and in different ways to ensure understanding and to alleviate anxiety of residents and visitors.

3. Rumors, Misinformation, and Reputation Management

Misinformation and rumors can spread rapidly on social media, particularly in the absence of official information in the early stages of an incident. Once an incident occurs, media articles and opinions can quickly become exaggerated and taken out of context, creating dangerous misinformation.⁴ Agencies should be aware of dangerous rumors and misinformation on social media. These rumors may concern specific aspects of the agency response operations, in which case an immediate response should be considered. Leadership must be promptly advised when these situations arise in order to prepare a timely response. Not all comments necessarily need a formal response as humor, sarcasm, and user influence should be factored into the decision to respond. Routine and timely official updates and information will help to control misinformation and anxiety caused by emergencies, as well as build trust within the community. Without frequent official updates in a developing situation, online conversations can quickly lead to widespread and inaccurate assumptions, accusations, and misinformation affecting the perception, confidence, and trust of the public in the government response efforts. For example, upon learning that the Ebola patient information leaked, the agency promptly began tweeting (via @nycHealthy) everything that was known and unknown about the situation. This helped quell the fear and anxiety of NYC residents while test results were still pending and before the official press release.

METHODS

While developing social media monitoring capacity requires considerable time and planning, it can be approached as a relatively low-cost initiative that requires mostly staff time and existing technology resources. The following describes the planning considerations the DOHMH used to develop ICS monitoring capacity.

Overall Program Approach

The DOHMH identified a vendor to develop a training program on social media search tools, techniques, and information flow that would eventually be delivered to identified SMMT staff. As the vendor developed these materials, the agency focused on the operational requirements of integrating the monitoring function into ICS. In 2011, when planning began, it was a challenge to find individuals, much less organizations, with this expertise. Now in 2016 it is far more readily available.

Staffing

Staff is the key resource necessary to establish a monitoring operation. Depending on the scale of the incident, at a

minimum 1 and up to 3 staff should be assigned to monitoring to report back findings to leadership in a timely, concise, and consumable format. One of the first key decisions is whether your agency can assign existing staff to perform monitoring or whether external assistance is required. The DOHMH has assigned 10 staff to the SMMT as their primary role during an emergency. This allows for 1 to 3 staff to be assigned during any given 12-hour operational period, with enough redundancy for 24-hour operations. The number of staff dedicated to this role was deemed appropriate given the size of the agency and the wide scope of roles and responsibilities of both day-to-day and emergency operations.

It is now common for smaller jurisdictions that may not have internal staff available to work with “virtual volunteers” who specialize in monitoring to assist response agencies during emergencies. Ideally, the agency can have both internal and external support that work together to handle the vast amounts of data created online during an emergency. The concept of using external volunteers to assist with monitoring (and other digital response needs) is known as Virtual Operations Support Teams (VOST).⁵ These volunteers may or may not be affiliated with a response organization but are available to provide assistance to affected area jurisdictions. Currently, the DOHMH is considering training a cohort of NYC Medical Reserve Corps volunteers to serve as VOST with distinct but complementary responsibilities to the SMMT.

ICS Positioning

The agency must decide where monitoring will be positioned within the ICS structure. Social media spans the interests of many areas of a public health agency on a day-to-day basis, but for the purposes of integrating monitoring capacity into ICS, the primary stakeholders are the Planning Section and the PIO. Since many public health agencies are using social media on a daily basis, emergency managers should meet with those stakeholders to discuss the strengths and weaknesses of each approach. While the situational awareness that monitoring provides is useful for the Planning Section, the conversations that inform message development and rumor control are just as important for the PIO. More important than ICS positioning is the ability for the team to quickly communicate to leadership to inform decision-making. The DOHMH has positioned the SMMT under the PIO, with the SMMT leader reporting directly to the PIO. This was the most logical decision because the selected SMMT leader also managed agency social media accounts and was already positioned under the PIO. The SMMT leader also included the Planning Section Situation Unit on all communication and can communicate directly with the planning section chief as needed.

Monitoring Team Structure

The SMMT assigns specific roles to each member during a work shift to effectively search, filter, identify, and curate relevant information. The SMMT is broken down into

3 positions, each with detailed job action sheets for reference during their shifts. The scale of the incident dictates the need for all 3 of these positions. In a smaller incident, such as a single point-of-dispensing (POD) operation, the responsibilities can be handled by a single staff member.

SMMT Leader

The SMMT leader manages all aspects of the monitoring operation including initial mobilization, ongoing operations, and reporting. The leader reports to the PIO and provides the overall direction for the 2 subordinate positions, the monitoring specialist and the analyst. The leader attends all relevant ICS and PIO meetings to ensure situational awareness and knowledge of incident objectives, which drives much of the social media queries. The leader is responsible for immediately communicating all urgent discoveries that may affect agency operations in any way. For non-urgent issues, summary reports of findings are put together at the end of the shift. The leader also shares information with the Planning Section Situation Unit, which incorporates information into the situation reports. The leader also assists the team with monitoring as needed.

SMMT Monitoring Specialist

The monitoring specialist is the “frontline” of the social media information flow. This position is responsible for continually refining the search criteria (keywords, hashtags, and locations) in order to identify the most relevant content, individuals, and organizations pertaining to the incident and in line with agency objectives. The specialist must also categorize content for the purposes of creating consumable and organized reports, for example, classifying content as a rumor, question, misinformation, or request for help. All content identified by the specialist is passed on to the analyst for further verification and follow-up as needed. Furthermore, the specialist will alert the leader to anything requiring immediate action.

SMMT Analyst

While the analyst also assists the specialist in identifying new content, the main role of the analyst is to collate information received from the specialist to create the operational period summary report. The analyst will ensure that the most relevant and influential content is included in the report, which will be reviewed by the leader and submitted to the PIO and Situation Unit.

Logistics

The DOHMH has dedicated a conference room with existing desktops, projector, and phone line as the main space for the SMMT to work during an ICS activation. The room is located on a floor connected to the backup generator in case of an electrical power outage. While there are communication and workflow advantages to having staff assembled in one room, monitoring can still be performed effectively from

anywhere with Internet connectivity. Additionally, in case agency network infrastructure fails, the SMMT has access to laptops with wireless broadband modems using a private Internet service provider. To assist with communication between and outside the SMMT, a generic agency e-mail account was created that all SMMT staff were given access to. This e-mail address was used to register for social media accounts (eg, Twitter, Instagram) and tool subscriptions so that any SMMT staff can log in without creating personal accounts.

Agency and Jurisdictional Policies

Social media policies vary widely across jurisdictions and in some cases may not exist at all. Whereas one jurisdiction may allow individual agencies to have complete independence with regard to posting social media content, others, such as NYC, have policies governing agency social media use and online behavior. As mentioned above, one of the key values of monitoring social media is gathering conversations and questions to help inform your public communications. The ability to answer questions or quickly issue messages during a rapidly changing incident is a tremendous benefit of social media. The SMMT does not issue responses but rather makes recommendations when a message or response might be appropriate. Agencies should be familiar with jurisdictional social media policy to determine what is permitted during an emergency, for example, whether the agency is allowed to post uniquely created messaging or whether it must go through a higher level of approval. In NYC, during a citywide emergency (eg, Hurricane Sandy), all official Twitter messages were to be posted by the City of New York (@nycgov) and Mayor of New York (@NYCMayorsOffice) accounts only. All other agencies were asked to retweet those messages, as opposed to creating their own content, to ensure consistent messaging. However, in the case of a smaller incident led by the health department (eg, hepatitis A exposure or Legionnaires' disease), creating our own content is permitted and other city agencies are encouraged to retweet to help disseminate the message.

Social Media Tools and Staff Training

Effective social media monitoring can be done by using an assortment of free web-based social media tools; however, there are certain limitations.⁶ Performing more complex search queries (eg, Boolean with location data) and in-depth analysis of results requires a paid subscription social media tool. Funds permitting, access to a proprietary analytical tool will allow for deeper analysis, simultaneous multiple platform searches, and overall enhanced functionality. The DOHMH assembled a work group that assessed several analytical tools based on demonstrations and trial periods to determine which option was best.

To prepare the SMMT for their emergency role, the vendor delivered a full day of training in August 2013, after which

the team was declared ready to be mobilized for future ICS activations. Since the foundational training, which was focused solely on free search tools, the DOHMH has procured other analytical tools used for daily programs as well as the SMMT. These tools allow for detailed metrics on both outgoing agency messages as well as creating complex queries to find the most relevant information during emergencies. Many subscription tools now offer alerting features based on a customized search criteria, which is helpful when staff cannot actively monitor or during off-shift hours.

Leadership Awareness

Once monitoring preparations are in place, it is important to advise agency leadership of this new capability. Although the SMMT reports to the PIO, it should be promoted and presented to leadership as a new function that serves the overall ICS response. For example, when monitoring the aftermath of a building collapse in NYC, there is relevant content on social media that is useful for situational awareness and PIO communications, but also issues such as air quality and mental health for environmental and mental health responders, respectively.

RESULTS

Since 2013, the DOHMH has monitored social media for 6 emergency incidents as well as a major full-scale exercise. The SMMT has been formally activated 3 times: the 2014 response to the NYC Ebola case, the 2015 Legionnaires' outbreak, and the 2016 Zika virus response. Prior to that, individual members of the SMMT were asked to perform monitoring outside of an official ICS activation for smaller emergencies and planned events to ensure awareness of conversations and for health-specific concerns. The following discussion provides details on 3 incidents during which the DOHMH monitored social media.

Potential Hepatitis A Exposures

In August and September of 2013, there were 2 incidents of potential hepatitis A exposures in food service workers. In both cases, a single POD was opened by the DOHMH to provide vaccines to patrons of the establishments. These types of incidents are considered minor public health emergencies requiring a limited ICS activation. After the press release and social media messages were posted about the exposure and vaccination offering, 2 SMMT staff were mobilized to monitor for questions, misinformation, rumors, commentary about the affected restaurant and market, POD operations, and DOHMH staff. As expected, both incidents generated a significant amount of online activity, but nothing that required urgent action by leadership. In general, there was positive feedback regarding the POD, but some negative remarks about long wait times and disparaging remarks about the food establishments.

Major Mass Prophylaxis Exercise

The Rapid Activation for Mass Prophylaxis Exercise (RAMPEX) held on August 1, 2014, was a no-notice full-scale exercise that included mobilizing 30 PODs throughout NYC, a POD Operations Center, a NYC Strategic National Stockpile receiving warehouse, and transportation security. The exercise involved the notification and deployment of over 1000 individuals from 13 NYC agencies, private warehouse and transportation vendors, and 3 law enforcement jurisdictions.⁷ The SMMT was notified in advance and used the opportunity to practice their monitoring skills using the tools to find relevant information. Mainly, the DOHMH wanted to monitor press coverage and public conversation about the exercise. While most of the media coverage and conversations were positive and no urgent action was necessary, there were conspiracy theories and distrust of government, which was exacerbated by the coincidental timing of the first Americans diagnosed with Ebola in Africa being transported back to the United States for medical care.

Ebola

The DOHMH began monitoring social media for Ebola-related issues in August 2014. Prior to the diagnosis of the only NYC Ebola case, there was already abundant Ebola media coverage on the Dallas patient death and several other potential cases that caused public alarm.⁸ Confirmation of the NYC Ebola patient on October 23, 2014, and subsequent details of the patient's movements around NYC created significant online hysteria and fear. The SMMT were able to identify and address misinformation and rumors using official social media channels and gathered information that informed messaging. Specifically, rumors of new cases in different NYC neighborhoods were dispelled, as well as misinformation that involved drinking saltwater or eating kola nuts as methods to prevent or cure Ebola. Many rumors originated in Western Africa and spread to the United States, but with relatively low volume of mentions in NYC. To help prevent the spread of these rumors in NYC, outbound messages stressed that there was no cure for Ebola. There were many instances of the public showing themselves or others wearing face masks and gloves on the subway or at airports; thus, emphasis was placed on Ebola transmission facts and that it is not an airborne disease. There was general positive sentiment of the Commissioner of Health for being a calming and reassuring figure during the response. The SMMT was able to show examples of New Yorkers sharing images of themselves holding the Ebola palm cards that were distributed by the DOHMH community outreach teams and general appreciation of the community education efforts.

DISCUSSION

Using social media for situational awareness and operational intelligence is gaining momentum, but is not consistently used or formally integrated into ICS. The reasons for slow adoption vary from staff and expertise limitations to lack of formal

guidance or requirements. Incorporating social media as part of formal emergency response efforts should be considered in federal standards, such as the National Incident Management System, which would prompt a stronger movement to adopt social media monitoring as a capability.⁹ Nevertheless, there is already a strong justification for dedicating resources to developing this capability, as it has already proven useful in several real emergencies and planned events. Social media can often be the primary source for real-time information and awareness, with substantial utility for the Planning Section and PIO. As mobile computing and use of social media continue to grow, so will the amount and type of information from monitoring activities, especially during emergencies.

Having staff who can stay current with the rapidly changing social media landscape is also a challenge in maintaining an effective monitoring program. If the capability is maintained internally, it requires staff who can dedicate time to staying current with social media trends, tools, techniques, and verification methods (beyond the scope of this article). However, this also highlights the advantage of collaborating with external agencies that specialize in monitoring to alleviate the burden on internal resources.

It is becoming more common for people to use social media platforms to request immediate assistance. When phone systems are down or overwhelmed, calling 911 may not be an option.¹⁰ Health department staff who are monitoring may come across urgent life safety requests (that are beyond the capabilities of health agencies). This presents a dilemma of how to handle these issues and the liability for responding. Agencies should seek to formalize a process to quickly route these issues to the appropriate response agencies for possible assistance.

CONCLUSIONS

Over the past decade, social media has increasingly been used as a main communication method during emergencies. In these times, operating without social media intelligence can be detrimental to the agency, particularly from an awareness and public messaging standpoint. Public health agencies should dedicate resources to monitoring social media for all emergencies and major planned events in which they have a lead or supporting role. The ability to use social media to inform decision-making during emergencies allows for agile and effective operational response planning, which in turn builds public confidence and credibility in the government approach.

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