ISDS 2012 Conference Abstracts

Framing the Use of Social Media Tools in Public Health

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Objective

Recent scholarship has focused on using social media (e.g., Twitter, Facebook) as a secondary data stream for disease event detection. However, reported implementations such as (4) underscore where the real value may lie in using social media for surveillance. We provide a framework to illuminate uses of social media beyond passive observation, and towards improving active responses to public health threats.

Introduction

User-generated content enabled by social media tools provide a stream of data that augment surveillance data. Current use of social media data focuses on identification of disease events. However, once identification occurs, the leveraging of social media in monitoring disease events remains unclear (2, 3). To clarify this, we constructed a framework mapped to the surveillance cycle, to understand how social media can improve public health actions.

Methods

This framework builds on extant literature on surveillance and social media found in PubMed, Science Direct, and Web of Science, using keywords: "public health", "surveillance", "outbreak", and "social media". We excluded articles on online tools that were not interactive e.g., aggregated web-search results. Of 2,064 articles, 23 articles were specifically on the use of social media in surveillance work. Our review yielded five categories of social media use within the surveillance cycle (Table 1). This framing within surveillance illuminates a range of roles for social media tools beyond disease event detection. [Insert Image #1 here]

Finally, we used the 1918 Influenza Pandemic to illustrate an application of this framework (Fig 1), if it were part of the public health toolkit. In 1918, America was already becoming a "mass media" society. Yet a key difference in mass communications today is the enabling of public health to be more adaptive through the interactivity of social media.

Results

We used this "pre-social media" disease event to underscore where the real value of social media may lie in the surveillance cycle. Thus for 1918, early detection of disease could have occurred with many, e.g., sailors aboard ships in New York City's port sharing their "status updates" with the world. [Insert Image #2 here]

After detection, social media use could have shifted to help connect and inform. In 1918, this could include identifying and advising the infected on current hygiene practices and how to protect themselves. Social media would have enabled the rapid sharing of this information to friends and family, allowing public health officials to monitor the response. Then, to support multiple intervention efforts, public health officials could have rapidly messaged on local school closures; they could also have encouraged peer behavior by posting via Twitter or by "Pinning" handkerchiefs on Pinterest to encourage respiratory etiquette, and then monitored responses to these interventions, adjusting messaging accordingly.

Conclusions

The interactivity of social media moves us beyond using these tools solely as uni-directional, mass-broadcast channels. Beyond messaging about disease events, these tools can simultaneously help inform, connect, and intervene because of the user-generated feedback. These tools enable richer use beyond a noisy data stream for detection.

Surveillance Cycle Steps	Categories of Social Media Use
Detect: Identify disease event *(collection of data and consolidation and interpretation of data)*	**1. Utilize as secondary data stream** for disease event detection *(passive)*
Connect & Inform: Provide resources and information e.g. status updates *(dissemination of information)*	**2. Disseminate** links to information/resources and status updates *(active)* **3. Monitor response** to the information *(passive)*
Intervene: Respond to disease event *(take action to control and prevent)*	**4. Utilize as intervention** *(active)* **5. Monitor response** to intervention *(passive)*

Table 1. Social media use in supporting information for action

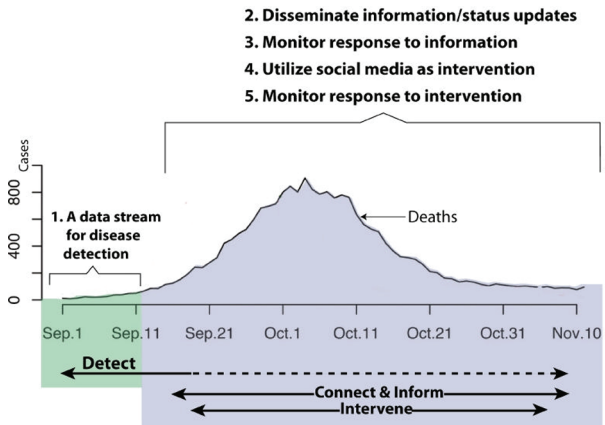

Fig. 1. Social media mapping to 1918 epi curves for NY State (1).

Keywords

Surveillance; Public Health; Social Media

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