Riding the Mobile Wave

What Local Health Departments Need in order to
Adopt Social Media and Mobile Health Technologies
for Emergency Preparedness

UPMC Center for Health Security and the National Association
of County and City Health Officials (NACCHO)

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Executive Summary

The American public's use of social media and mobile technologies has grown dramatically in recent years. While the public is increasingly using these platforms for day-to-day communications, most local health departments (LHDs) in the US are not regularly using these tools to receive information or push out communications to the public. Recent events such as the 2009 H1N1 influenza pandemic and Hurricane Sandy demonstrate the potential value of social media and mobile health technologies (mHealth) for hastening the speed of communicating vital emergency preparedness influenza pandemic preparedness and response messages. If LHDs could more quickly communicate critical preparedness information to the communities they serve, then adverse effects of disasters, such as lives lost and economic damage, could potentially be mitigated. This study analyzes what organizational factors LHD staff perceive as necessary to support their use of social media and mHealth. The lessons learned from this study can inform policymakers at the local, state, and federal levels of how to support LHDs in advancing their use of social media and mHealth for emergency preparedness. Lessons can also provide LHDs with insights as to how peer departments *in* other communities have overcome or managed obstacles hindering use of these platforms.

The UPMC Center for Health Security and the National Association of County and City Health Officials (NACCHO) produced this report to catalyze improvements in local health departments' ability to use social media and mobile technologies to improve preparedness efforts. We conducted 65 interviews with LHD staff across the country and analyzed existing data and studies on the use of social media and mobile technologies for disaster management. This report outlines organizational factors that enable or impede LHDs' ability to use social media and mobile health platforms, as identified through interviews with LHD staff, and puts forth a series of recommendations for local health practitioners and state and federal policymakers to support use of these platforms at the local level.

Findings: Main Factors Influencing LHD Use of Social Media and mHealth

In-house Capacity: *ability of both staff and the LHD as a whole (eg, other organizational components such as strategic plans and internal management) to effectively integrate social media and mHealth programs into their department's overall communication and emergency preparedness strategy.*

Primary factors that influence an LHD's in-house capacity to use and maintain social media and mHealth programs include the technical knowledge of staff and throughout the LHD as a whole, the amount of funding and number of staff specifically allocated to social media and mHealth efforts, and the availability and accessibility of hard resources and technical support.

Leadership Support and Policies:
implied or expressed support of leaders, in the LHD or at other government levels, to encourage the use of social media and mHealth, and the existence of specific rules or policies, formal or informal, regulating or encouraging the use of such technologies.

Many LHD staff identified factors that influence the type of support they receive for using social media and mHealth, including support from their department leaders; internal policies at LHDs regarding social media and mHealth use; and local, state, and federal government policies encouraging the use of platforms.

Legal and Security Issues: *concerns around security of information and the application of legal guidance for mHealth and social media programs.*

Many LHDs identified legal and security issues that inhibit their use of social media and mHealth, including lack of clarity around the applicability of federal and state privacy laws, concerns about how to manage liability issues that can arise with platform use, and lack of understanding how security breaches should be managed.

Audiences: *intended and targeted audiences at which LHDs aim to direct programs, including those in different geographic locations and those considered vulnerable or at risk.*

Regarding the use of social media and mHealth to reach specific audiences, interviewees cited 3 primary factors: different platforms are sometimes better suited for different purposes; many LHDs lack the coordination and capability to use social media and mHealth for 2-way communication with various populations; and many LHDs may not have the resources necessary to use platforms to reach vulnerable populations.

Recommendations and Implications: Moving Forward in Policy and Practice

Actions for Local Health Practitioners

Assess internal baseline capacity and augment, as needed, with the support of external partners.

LHD leaders should take steps to better understand their department's baseline capacity to use social media and mHealth for emergency preparedness and identify external resources that could help fill gaps in staffing and funding. Health departments should also identify community-based organizations (CBOs) and academic institutions that can offer pro bono or low-cost services to fill staffing and training gaps, such as unpaid interns and contractual services.

Expand existing communication plans.

LHDs should integrate social media and mobile technologies into existing communication plans. As many interviewees emphasized, these platforms should not replace current communication mechanisms, but rather supplement current approaches to circulate information rapidly and to wider audiences.

Learn from existing practices at other LHDs: LHD staff should take steps now to engage with and learn from their colleagues at other LHDs.

As some interviewees noted, merely talking with colleagues in the neighboring county's health department or at a health department with visibly advanced efforts can help guide staff in developing programs and establishing policies.

Identify resources to inform health department policy development: LHDs can take steps to address legal and security concerns while waiting for concrete policy actions.

Health departments should be proactive in identifying resources, such as sample policies from other LHDs, guidance from other entities that details managing liability concerns for specific platforms, and pro bono or low-cost legal consultant services, to vet concerns and department actions.

Identify key audiences and understand how they communicate.

While use of social networking sites and mobile devices is generally widespread, LHDs must verify that targeted populations have access to these platforms to ensure they are effective communication mechanisms.

Increase coordination with CBOs.

LHDs often benefit from partnerships with CBOs that can circulate messages to specific communities on behalf of the health department or promote LHD social media accounts and mHealth programs. LHDs should therefore dedicate personnel and resources to building strong partnerships with CBOs that link to key communities, including vulnerable and at-risk populations, volunteers, hospice and home healthcare providers, and various age groups.

Support system interoperability among programs and jurisdictions.

LHDs should not only vet the information within their programs for credibility and subsequently use it to provide situational awareness, but they should also look to one another to share information during emergencies. Furthermore, development of mHealth programs that allow systems and devices to share data, whether within one LHD or among many, should be encouraged.

Actions for Policymakers at the Local, State, and Federal Levels

Promote the creation of an information exchange database.

As evidenced by numerous interviewee requests, a database or resource for LHDs to share examples of current efforts, funding sources, or successful uses and applications of mHealth and social media would be extremely useful for LHDs in identifying best practices and uses for different platforms. State and local officials should work to form or support the creation of such a

database to serve as a mechanism for sharing information among LHDs regionally.

Identify how to integrate local information sharing into a national-level system.

Federal agencies should also support creating a database at the national level that joins these local efforts and potentially includes other key stakeholders, such as nongovernment organizations and CBOs.

Support research to improve the evidence base for technology use.

While statistics indicate increasing and widespread use of social networking sites and mobile devices, LHDs lack the evidence base to demonstrate the role of these platforms in advancing public health activities, including emergency preparedness. Policymakers should explore ways to incorporate this needed research into efforts that are already being funded.

Develop methods to disseminate uniform messages.

State and local officials should take steps to improve information management. Interviewees generally emphasized 2 challenges when using platforms for emergency preparedness: managing numerous communication mechanisms for different populations and uncoordinated messages with other public officials. State and local officials should therefore take a more active role in developing and circulating pre-approved messages to local entities, including messages that are tailored for specific platforms, specific stages of emergencies, and specific populations.

Modify requirements for Public Health Emergency Preparedness (PHEP) Cooperative Agreements.

The Centers for Disease Control and Prevention (CDC) should modify PHEP requirements to mobilize local efforts to use social media and mHealth. As PHEP funds often inform LHD leadership decisions regarding resource

allocation and staff training, prioritization of these platforms in PHEP requirements can support local use. Moreover, as funding drives actions, revisions to PHEP requirements will encourage LHDs to use social media and mobile technologies as part of routine practice.

Revise public health preparedness capabilities.

CDC's Office for Public Health Preparedness and Response (OPHPR) should revise the public health preparedness capabilities used to provide national standards for state and local planning. Interviewees specifically suggested that the sections on emergency public information and warning and information sharing be revised to encourage use of new media, such as social media and mobile devices.

Circulate guidance to LHDs regarding the applicability of existing federal laws.

The Department of Health and Human Services (HHS) and other federal agencies, as appropriate, should clarify how and when laws such as the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule and the Freedom of Information Act (FOIA) apply to LHDs in relation to their use of social media and mHealth. Guidance should also direct LHDs to legal resources to verify compliance with laws.

Clarify how new technologies are regulated.

Some LHDs expressed confusion about to whether mobile applications and other mHealth programs may be regulated. Steps have been taken by the Food and Drug Administration (FDA) to regulate medical mobile applications, but it remains unclear if applications for public health and emergency preparedness will also be regulated. Federal agencies should clearly communicate to LHDs what types of technologies will be regulated and for what purposes.

Support resources to reach vulnerable and at-risk populations.

While partnerships with CBOs are important, it is imperative that LHDs do not rely solely on external entities to reach vulnerable and at-risk populations. Grants and policies targeting LHDs should enable health departments to use translation services and other resources. As many interviewees noted, lack of these resources inhibit their ability to develop population-specific programs using new media platforms. Many LHDs aim to provide social media sites, short message service (SMS) programs, and mobile applications in different formats to serve non-English-speaking, deaf, and blind populations, but they need support to do so.

Summary of Key Findings and Recommendations

FINDINGS			RECOMMENDATIONS	
Key Factors	Influences	Suggestions/Requests	LHDs	Policymakers
In-House Capacity	• Staff knowledge • Funding • Resources and IT support	• Training • Information sharing • Industry collaboration	• Assess capacity and augment with external support • Expand communication plans	• Create info exchange database • Integrate local information sharing into national system
Leadership Policies and Support	• Support for mHealth • LHD policies to support use • Local, state, federal policies to support use	• Share best practices • Build evidence base • Share internal policies • State and federal encouragement	• Learn from other practitioners	• Learn from other practitioners
Legal and Security Issues	• Applicability of federal laws • Liability concerns • Security impediments to expansion	• Federal guidance • Public/private support for managing liabilities	• Identify resources for policy development	• Provide guidance on applicability of federal laws • Clarify regulation of new technologies
Audiences	• Purpose-specific platforms • Limited capacity for 2-way communication • Specific needs of vulnerable populations	• Improved collaboration with CBOs and other external organizations • Integrate mHealth and social media into communication plans	• Identify key audiences and how they communicate • Coordinate with CBOs • Support program and jurisdiction interoperability	• Support resources to reach vulnerable and at-risk populations

Introduction

Social media and mobile health technologies (mHealth) are influential tools for promoting preparedness before an emergency and facilitating response following a disaster.* Local Health Departments (LHDs) could benefit from using these technologies on a day-to-day basis to share public health preparedness messages and during emergencies to communicate with the public and enhance situational awareness.

Americans are increasingly using these platforms both on a day-to-day basis and during emergencies.

Americans are increasingly using mobile technologies (eg, cell phones) and social media to find and share information. According to a May 2013 Pew study, 91% of American adults own cell phones,[1] a 9% increase since May 2010.[2] Of those cell phone owners, 81% use their phones to send or receive text messages, and 60% use them to access the internet.[1] Another December 2012 Pew study indicates that 67% of adults who use the internet also use social networking sites. The use of such sites is reaching high levels among various populations, irrespective of where they live, their socioeconomic status, gender, race/ethnicity, and level of education.[1,3]

Americans are turning to these technologies to find and share general information and to access health information specifically.[4] According to a November 2012 Pew study, 31% of American adults who own cell phones use them to look up health or medical information online.[5] The internet has become a primary source of health information, aside from direct consultation with healthcare providers, as 80% of adult internet users in the US have looked for health or medical information online.[6,7]

The rising use of cell phones and social media by the American public on a day-to-day basis has led to a corresponding rise in communication through these technologies to share and find information during emergencies.[5,8,9] According to a 2012 American Red Cross survey, mobile applications and social media are now tied for the fourth most popular ways to get information during an emergency, following only TV, radio, and other online news.[10] Indeed, 20% of respondents stated that they had received some form of emergency alert from a mobile application during a recent emergency. Furthermore, the public has a growing expectation that public health response personnel will use these technologies in disasters. In the same survey, more than three-fourths of respondents stated that they expect assistance within 3 hours of posting a request on social media, a 68% increase from the organization's 2011 survey.[10]

> 91% of Americans own cell phones; 81% use them to send and receive text messages; 60% use them to access the internet.

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* In this study, mHealth refers to the use of wireless technologies, such as mobile phones, tablets, and other communication devices, in the practice of medicine and public health. Common uses include delivery of health services and information, such as mobile applications and text messaging campaigns. Social media include web- and mobile-based platforms that allow users to build social networks and develop the creation and exchange of content. Examples include Facebook, Twitter, Pinterest, and Instagram.

LHDs could benefit from communicating on the same platforms as the public.

As Americans increasingly rely on these sources for day-to-day news and health information, LHDs can use these platforms to share relevant preparedness information with the public. LHDs can use social media and mHealth programs to target specific populations with uniquely tailored preparedness messages, address the particular health concerns of various subpopulations, and coordinate with community leaders to disperse critical preparedness information.[11-13]

LHDs also can benefit from using these platforms during emergencies. Evidence suggests that LHDs could use cell phones and social media to provide real-time updates,[14-16] rapidly exchange information with the public,[17-21] and enhance situational awareness during emergencies.[22,23]

Most LHDs are not using these platforms effectively.

Despite these and other potential benefits, only a small fraction of LHDs have adopted and used such technology effectively. According to one study, as of early 2012 only 24% of LHDs had a Facebook account, and only 8% had a Twitter account.[24] Of these, LHDs averaged only 3.0 Twitter followers and 3.3 Facebook likes for every 1,000 residents in a jurisdiction.[24] The use of mHealth at LHDs is even more limited; there is little to no peer-reviewed literature describing its use. However, the limited evidence of a small number of collected case studies and model practices indicates an increasing number of mHealth projects are being implemented at LHDs across the country.

This study attempts to identify the challenges LHDs face when carrying out mHealth and social media programs and offer potential solutions to help LHDs effectively use these technologies.

Given the limited use of these promising platforms by LHDs, the UPMC Center for Health Security and the National Association of County and City Health Officials (NACCHO) interviewed staff at LHDs across the US to identify factors that prevent LHDs from using these technologies in preparedness efforts and to examine how front-running LHDs have overcome those barriers. This study complements existing research on the use of these platforms at the local, state, and federal levels[24-26] and the use of these technologies during emergencies.[17]

More research is needed to understand how LHDs use these platforms and what enables them to successfully do so; this study attempts to help fill that void. Given the abilities of social media and mobile technologies to rapidly transmit information, it is important that emergency preparedness communications integrate these platforms into messaging efforts. Certain populations, such as the millennial generation, may be more apt to receive information or engage with public officials if they receive emergency information via these platforms, but further research is needed.

LHDs cannot ignore the day-to-day use of social media and mHealth and expect to be able to use them effectively during an emergency. In their effort to engage with specific communities and offer preparedness information prior to an emergency, LHDs establish credibility, an online following, and organizational competence or expertise. All of those factors are necessary components for the successful use of these platforms during an emergency. In recognition of this, and the potential of these platforms, national experts and federal officials have called on researchers and practitioners to identify ways to increase the use of these platforms for preparedness.[27,28]

In a fiscal climate of diminishing public health funds and workforce, especially at the local level, LHDs need to be more efficient than ever before. LHDs need to do more with less staff and money: prepare communities for emergencies and help with response and recovery when emergencies occur. The effective use of social media and mHealth can help LHDs do just that, enabling them to directly send information to users of these platforms.

This study aims to clarify the challenges faced by LHDs interested in implementing such programs, to share the successes of LHDs that have overcome those challenges, and ultimately to mitigate organizational barriers that might prevent LHDs from adopting these technologies for preparedness across the country.

Methods

This qualitative study examines LHDs' organizational capacity to adopt and use social media and mHealth technologies for public health preparedness. The research team received approval to conduct the study through the University of Pittsburgh Medical Center's Institutional Review Board (IRB).

At the outset of this study, the research team conducted a literature search and used the 2010 NACCHO National Profile of Local Health Departments to identify an initial pool of 10 LHDs that used these platforms for public health activities. The research team then used a snowball sampling method to expand the interviewee pool. In addition, the research team hosted a 45-minute sharing session at the 2013 Public Health Preparedness Summit, where more than 50 attendees, mainly from LHDs, completed a survey about their organizations' use of social media and mHealth. Those survey respondents who identified an existing mHealth or social media practice at their LHD were invited to participate in the study.

From January to June 2013, the project team conducted interviews by phone with practitioners at 47 LHDs from 23 states (N = 65). Interviewees held positions in various relevant departments: communications (n = 8), public information and public relations (n = 15), communications and public information with a focus on emergency risk (n = 6), social media– or mHealth-specific positions (n = 6), emergency preparedness and response (n = 19), and public health programming and education (n = 11). The final interview pool included LHDs in each Federal Emergency Management Agency (FEMA) region and each category size of jurisdiction served as defined in the 2010 NACCHO Profile (see Appendix).

During interviews, which typically lasted 45 to 60 minutes, the research team posed pre-scripted, open-ended questions aimed at eliciting examples of existing social media and mHealth practices, particularly those focused on emergency preparedness. Questions were designed to elucidate organizational factors that interviewees deemed necessary to facilitate implementation of social media and mHealth programs; to identify barriers to implementation; and to determine how interviewees perceived external support, such as from nonprofit organizations, the private sector, and state and federal government, in the implementation and management of programs.

One member of the research team took detailed notes for each interview. The research team developed a qualitative coding method to collect and sort data. After discussing general impressions of interviewee responses, trends, and recurring themes addressed by interviewees, the research team categorized findings into 4 main areas: in-house capacity, policies and leadership support, legal and security concerns, and key audiences. None of the interviews was transcribed or coded via computer. At least 2 team members manually coded each section of the 4 main areas to minimize bias.

Limitations

The convenience sample interviewed for this study is not a representative sample of the 2,800 LHDs in the US. However, because we were able to include participants from each FEMA region and each category for size of jurisdiction served, this sample illustrates organizational capacity challenges that many LHDs likely face. LHDs included in the study varied as to their stage of program development and focus area for mHealth and social media practices. While not all interviewees discussed preparedness programs specifically, all interviewees did identify the organizational factors that enable or hinder their ability to develop and maintain programs. Such organizational factors affect an LHD's ability to develop and maintain a social media or mHealth campaign, regardless of programmatic focus area. Moreover, these findings illustrate the aspects of organizational capacity that LHD staff view as significant at different stages of program development.

Findings: Main Factors Influencing LHD Use of Social Media and mHealth

Interviewees discussed key capacity issues that enable or hinder LHDs in using social media and mHealth, and they suggested ways LHDs could improve their work by using these technologies. The research team categorized the identified factors into 4 main thematic areas: in-house capacity, leadership support and policies, legal and security concerns, and key audiences. Within each of these thematic areas, the project team identified 2 or 3 factors that enable or hinder the use of such programs, as well as 2 to 4 suggestions or requests from LHDs that could improve uptake and use.

Interviewees described factors that influence current efforts as well as those that would likely influence future efforts. Other comments focused on suggestions and lessons learned from practices already in place at other LHDs that could be useful for others to adopt. The key factors identified for each thematic area were therefore drawn directly from interviewees' comments about efforts at their own or other health departments.

IN-HOUSE CAPACITY

This section refers to the ability of both staff and the LHD as a whole (eg, other organizational components such as strategic plans and internal management) to effectively integrate social media and mHealth programs into a health department's overall communication and emergency preparedness strategy.

In-house Capacity Factors
• Knowledge among program staff and throughout the health department
• Amount of funding and staff allocated to programs
• Access to hard resources and technical support

Suggestions/Requests
• Improve staff and department knowledge of platforms
• Expand LHD peer information-sharing about mHealth & social media
• Build collaborations with industry to improve in-house capacity

Key Factors

Knowledge among program staff and throughout the health department

The majority of interviewees explained that social media and mHealth programs were initially developed after an emergency or as a result of a staff member's advocating for such a program. Often, staff who encouraged the department to use these platforms themselves used social media or mobile devices in their personal lives. As one interviewee explained, "In this day and age, we don't poll people beforehand to see if they want us to use social media. I just knew when I came in that [something] was . . . missing."

For LHDs that had not already begun using these platforms for daily communications, recent emergencies, such as the 2009

> An emergency operations center (EOC) can't be an office; an EOC needs to be virtual.

H1N1 influenza pandemic, the Derecho, and Hurricanes Irene and Sandy, catalyzed their use. In reflecting on communication efforts during these events, many interviewees stated that being able to use social media and mobile devices enabled health department staff to communicate with various communities and organizations. One interviewee cited another advantage, explaining, "Your EOC [emergency operations center] can't be your office; it needs to be virtual."

Others who did not have such capabilities in place perceived these platforms as useful tools in the specified scenarios. Some interviewees explained that they started using social media for the first time in the midst of an emergency response, as Twitter, Facebook, and other platforms were perceived as quick communication methods to reach affected communities.

Others emphasized that LHDs need to invest in resources to support basic knowledge of how to use and maintain platforms because, as one interviewee explained, "As our population ages, the younger folks coming up and

filling positions are technology savvy. If we want to reach out and be there, we have to use these technologies. We have to have staff who know how to use these technologies and can quickly learn how to use updated versions and new technologies when they come on the market." Several interviewees noted that existing efforts to use mHealth or social media often involve staff whose technical knowledge of how to use these platforms came from their personal use, rather than formal training.

Some LHDs described formal training efforts to boost in-house knowledge of platforms, but many interviewees noted that only 1 or 2 staff knew how to use social media accounts and mobile platforms. Consequently, many indicated knowledge management as an issue. If the staff that maintains platforms is unavailable or were to leave the health department, the LHD would be unable to continue such efforts.

Some LHDs also host college interns or volunteers to work on social media and mHealth programs. While the use of external entities has helped alleviate staff burden and gaps in organizational capacity, many interviewees noted that these are typically one-time efforts. Sustainability of internship programs is a challenge, and they do not help to build the necessary organizational infrastructure for full-time staff to engage in such work.

Amount of funding and staff allocated to programs

The majority of interviewees noted that their departments do not receive funding allocated specifically for the use of these technologies (n = 53). In most cases, health departments run on programmatic funding that may permit the use of social media or mHealth on the given project. Many also explained that a lack of dedicated funding and insufficient staff training were roadblocks to social media and mHealth use. As one interviewee stated, "We have already done the needs assessment; we know that we need [these platforms]. Now it's about having the personnel [and] the funding to make it happen and having a person with the ability to manage the accounts."

Social media and mHealth programs differ in the resources, staff, and funding they each require. Generally, when LHDs start a social media effort, it is a no- or low-cost activity, since departments do not have to pay a user fee for social media accounts and can access accounts from computers and devices they already have. However, although social media accounts are initially a low-cost resource, health departments can incur costs for social media programs as efforts expand or because of staff turnover, when new staff need to be trained to use existing or new platforms.

The spectrum of use of mHealth programs was much wider than that for social media. Only a few interviewees had mHealth programs under way; many expressed an interest but noted, "[we] just don't have the resources to really put an effort behind the idea." Unlike social media efforts, LHDs likely incur costs when initiating mHealth programs, as these programs require devices, software, technical training, and other resources that the health department may not already have. Even if there were initial efforts to adopt platforms, funding restrictions often inhibit LHDs from purchasing the necessary devices and software for mHealth programs.

Despite the differences in start-up costs, many interviewees noted that funding and staffing limitations impede their abilities to maintain both social media and mHealth efforts. Departments must dedicate financial resources and staff time for general maintenance of programs, such as refresher trainings for staff, software, and technology updates.

> It doesn't matter if an account is free if you don't know how to use it well and if no one knows about it.

A few interviewees also underscored the importance of investing time and resources into publicizing, and essentially marketing, these efforts. As one interviewee noted, "It doesn't matter if your account is free if you don't know how to use it—more so, if you don't know how to use it well. And it doesn't matter if you use it well if nobody knows you have it." Interviewees noted that

investments in starting and maintaining programs are equally important and that part of maintenance costs should include efforts to gain followers and ensure that intended audiences are aware that these accounts or programs are available information sources.

Access to hard resources and technical support

Some interviewees noted that their health departments do not have enough hard resources (eg, computers, mobile devices, tablets) to initiate social media or mHealth efforts (*n* = 24). These health departments, which tend to be in rural areas, cannot support the development of these programs. Other health departments have the needed hard resources but struggle with access to accounts and devices.

Many interviewees explained that restricted access is a significant roadblock to social media efforts. Some (*n* = 26) identified lack of access to software and equipment as a challenge, either because their health department lacks sufficient resources or because social media sites are blocked from office computers. For example, one emergency preparedness coordinator explained that her health department had social media accounts but that all social media pages were blocked on office computers. Thus, she was only able to use and update accounts if she accessed them from her personal computer outside of work hours, and she was not paid overtime for doing so.

For other LHDs, limited staff knowledge, staff time, and access to devices impedes their ability to continue use of platforms. Therefore, a health department may be able to initiate an effort but not sustain it. As one interviewee noted, "Social media is a great tool for disasters, especially as cell phone use becomes more pervasive, and people are always attached to their phones. . . . The problem, however, is that social media require time, effort, and often funding. Those resources are often scarce."

While restricted access to websites and accounts impedes the use of social media, limited access to technical support for mobile devices often restricts use of mHealth programs. Several respondents (*n* = 27) indicated that access to technical support (eg, troubleshooting software) was a challenge, which included both internal capacity and access to an external support service. Some LHDs indicated that they use contractors or interns for technical support, if funds permit, to develop and manage mHealth and social media programs, yet the majority of participants did not have such resources. Furthermore, many interviewees indicated that even if their department explored hosting unpaid interns or volunteers, their staff is overcommitted and would not have the time to train and supervise them.

> Restricted access impedes use of social media, and poor tech support impedes use of mHealth apps.

CASE STUDY 1: Toledo-Lucas (OH) County Health Department: In-house Capacity for Social Media

Since 2010, the Toledo-Lucas County Health Department (TLCHD) has used various social media platforms to communicate preparedness and other public health messages with the public. TLCHD uses Facebook to share day-to-day information and recovery information after disasters and Twitter to share up-to-date, real-time information as an event unfolds. YouTube is blocked on county computers because of the cost associated with the additional bandwidth needed to stream video. While several staff members are involved in social media efforts, final content is vetted and posted through the department's public information officer: "If someone wants to post something, it goes through me; I make a determination what is a good outlook on social media, what can be posted, what should be posted."

TLCHD built much of their in-house capacity for social media while the organization served as an Advanced Practice Center (APC) site. NACCHO administered the APC program on behalf of CDC for 10 years, ending in 2012, to provide free preparedness resources that other LHDs can easily implement. The products are easily adaptable and have been tested in real-world environments by LHDs. TLCHD's APC grant enabled their more regular and serious use of social media. Through their development of social media training for LHDs nationwide, the department staff increasingly improved their own social media skill sets. As an interviewee stated, "The more we work with social media, use it, talk about it, etc, the more it reinforces that we really should be on it, should be using it. If we're not using it, we're not staying ahead of the curve. That's where all our constituents are, and we need to be there to meet with them in that space." TLCHD also looks to other health departments to understand trends and improve their knowledge in the field.

In 2012, TLCHD provided an online training session and a "commercial" for other LHDs to learn how to use and navigate social media platforms. With the resources from the APC program, they hosted several speakers for the training session, including representatives from the MCUrgent program (Morris County, NJ) used in Hurricane Irene and the VTResponse website. In 2012, TLCHD had to revise 4 toolkits that CDC had developed: 2 risk communications and 2 environmental health toolkits. TLCHD used 1 of the risk communications toolkits to develop social media templates for rural counties. Across Facebook and Twitter, they developed templates for various catastrophic disasters, in addition to developing messaging maps for Twitter and Facebook. While developing these tools for other LHDs, still available on NACCHO's website, TLCHD strengthened its own in-house capacity to use social media effectively.

TLCHD staff developed an internal capacity for and subject matter knowledge of social media, and their public information officer currently oversees social media use in disasters in 19 health departments in their region. The department continues to build their existing knowledge and expertise in social media and share lessons learned with other health departments to enrich peer-to-peer learning and knowledge.

For more information:
www.lucascountyhealth.com

Suggestions and Requests

Improve staff and department knowledge of platforms

Some interviewees suggested that LHDs should offer more internal training sessions to help address concerns about staff knowledge and program sustainability (*n* = 13). Often, staff who manage social media or mHealth efforts are concentrated in one division of the health department (eg, communications or emergency preparedness). Therefore, more coordination between relevant divisions of health departments is needed to ensure that a health department's effort is not dependent on specific personnel.

Expand LHD peer-information sharing about mHealth and social media uses

LHDs need more structured opportunities to share information and ideas with each other. Many interviewees (*n* = 31) suggested that a database or resource for LHDs to share examples of current efforts, funding sources, or potential uses and applications of mHealth and social media would be extremely useful in helping LHDs to identify best practices and uses for different platforms. Mechanisms that allow LHDs to share information and experiences with each other are valuable in helping departments to identify valuable programs that can serve as models or can be replicated. One interviewee underscored the need for robust information sharing, explaining that "in a small health district, I have limited resources. But if I can learn from someone else, that can catapult me years ahead."

> In a small district, with limited resources, learning from others can catapult me years ahead.

Other interviewees also requested that telecommunications companies and state and local governments provide LHDs with resources to help share information about how to evaluate and expand programs, particularly in light of resource constraints. Almost all interviewees indicated that evaluation efforts were nonexistent and that, while metrics and indicators of program impact would be useful, the majority of health departments lack the capability to collect more detailed information. Several expressed interest in obtaining specific information on programs, including whether community members are even reading message content, whether platforms and related messages influenced behavior changes or initiated action (eg, getting a vaccine after a text reminder, or going to a healthcare provider after experiencing symptoms of foodborne illness and seeing tweets about a current foodborne illness outbreak), and whether platforms effectively reached key target audiences.

As one interviewee noted, "We would love to do surveys, evaluation, and more research around the effectiveness of our texting service in particular and also the consumer demographics. We want to track them to see if our intervention has long-term benefits, but this all takes time and money that we don't have. When we put resources toward starting our text program, nobody thought about putting aside resources for evaluation. We don't have the capability to make our program sustainable."

Interviewees also expressed specific interest in "looking at what we put out and finding out if people find our messages trustworthy, informative, and useful, and whether or not they take action based on what's in our messages. We want to know if a message from social media was a factor in their taking an action or making a change."

Without evaluation capabilities, many health departments face challenges in understanding the effectiveness and return on investment of their efforts. Some interviewees explained that it would be optimal to build programs to a point where social media and mHealth programs serve as crowdsourcing mechanisms that improve community-level situational awareness. Then, disaster management officials could use the data to inform decisions and also integrate information into other systems (ie, at the county, state, or even federal levels). This envisioned long-term goal could undoubtedly benefit public health disaster management, but very few LHDs are currently on a path to reach that goal.

Build collaborations with industry to improve in-house capacity

More interviewees reported use of social media than mHealth programs, because of the higher initial costs

and technical expertise associated with mHealth, but increased engagement with industry can enable LHDs to carry out both efforts. For all platforms, many LHDs requested that companies such as Apple or Facebook provide low-cost or free training sessions on how to use their products and services and offer technical support.

Additionally, as one interviewee noted, "It would be helpful to have a list of the products and services that each company offers—almost like a 'how to' guide to help us navigate through all the options. There are so many different devices and services, it's hard to figure out what is best for us, and we don't have the time to do that either." Overall, increased engagement with industry would advance the use of social media and mHealth programs across the board, as LHDs could capitalize on such relationships to build in-house capacity.

LEADERSHIP SUPPORT AND POLICIES

We asked interviewees to characterize the implied or expressed support of those in leadership positions, in the LHD or at other government levels, to encourage the use of social media and mHealth, and the existence of specific rules or policies, formal or informal, that regulate or encourage the use of such technologies.

Leadership Factors
• Support for mHealth and social media initiatives from LHD leadership
• LHD policies to inform program development and platform use
• Local, state, and federal policies and support for platform use

Suggestions/Requests
• LHDs should share best practices and advance an evidence base
• LHDs should share internal policies with other LHDs
• State and federal policies should encourage platform use at the local level

Key Factors

Support for mHealth and social media initiatives from LHD leadership

Some interviewees noted that convincing leaders of the benefits of social media and mHealth remained a

challenge, and therefore leaders were perceived as being unsupportive of continuing use.

At health departments where there was an active social media or mHealth program, interviewees typically reported that such use would not be possible without the support of leaders. Many of those interviewees indicated that only when leaders became aware of the potential value of social media and mHealth, either through their own research or from younger staff members, were programs implemented and sufficient resources made available to run those programs. At LHDs without active existing programs, interviewees often cited the lack of leadership support as a primary factor hindering the uptake and maintenance of such programs. As one interviewee explained, "The only barrier so far is the lack of understanding among decision makers. We can overcome that by offering education, but that has proven to be the biggest challenge."

Many interviewees who felt that leaders supported their efforts discussed the process through which they were able to convince leaders of the value of these platforms. Frequently, it seemed, leaders needed to be satisfied that applying limited funds and staff time to using and promoting such programs was a worthwhile investment for the department and not simply a diversion for staff. As one interviewee explained, a department director could not envision how a health department could productively use social media and was quoted as saying, "I don't want to know every time someone goes to get an ice cream." However, once the department's leaders saw that it could be used as a part of an overall communications plan, and that it was not just something that "young kids" wanted to use, the director recognized the potential value, and gave the staff approval to pursue the use of social media and mHealth on behalf of the health department.

Several interviewees discussed the challenges of an aging public health workforce, particularly with regard to leadership positions. Interviewees noted that it was challenging to convince leaders of the value of social media and mHealth programs if leaders were not using such applications in their daily life, generally had less exposure to such technology, and had less interest in pursuing it.

Interviewees also noted that many leaders and staff shared fears that permitting the use of social media at work would open the floodgates to personal use of such platforms during work hours. This fear often prevented leaders from supporting social media and mHealth efforts. One interviewee explained that the information technology (IT) department could audit which sites were visited but could not determine the purpose of site visits. Thus, it would be impossible for the department to distinguish between work and personal use, and efforts to discourage employees from visiting social media sites for personal use would be ineffective.

LHD policies to inform program development and platform use

General health department policies were also a recurring topic that interviewees raised. The issues addressed in such policies ranged from vague guidelines about which sites to use for different types of messaging, to specific rules about who was responsible for posting messages and the circumstances under which those messages needed leaders' approval. As one interviewee explained, "One policy issue we struggled with was our program policy for social media. What we can do as an agency on behalf of our programs is more open, but our personnel policy is the opposite."

Some interviewees explained that there was confusion or disagreement among their staff regarding what types of policies should be in place. For example, it was unclear if the department should have policies in place prior to the development of any social media or mHealth efforts or if policies were only necessary for program maintenance and expansion, which would give staff the flexibility to begin efforts on a less restricted basis. Many interviewees also shared questions regarding what topics policies should address. Should policies address the variety of possible legal issues that could arise in using social media? Should policies assume a responsible workforce that is given the benefit of the doubt when it comes to time management, or should they specifically outline the amount of time that should be spent on these programs by each staff member?

Other interviewees explained that their health departments had elected to forego any policies,

making up 'rules' as they went along and trusting their staff to independently make responsible choices. One interviewee explained, "The city doesn't have a plan; they are winging it when it comes to usage and content. We don't have a written guide, because we don't want to go through the process of setting it all up only to have it shut down by the legal department." Others said that their health departments had spent months going over every possible detail that could be included in the policies and that they did not feel comfortable starting social media or mHealth programs without having such comprehensive policies in place.

Typically, though, interviewees described their health department policies as somewhere in the middle of that spectrum. As one interviewee explained, "There needs to be a balance between having policies to protect a trusted communications team, and wasting 12 months not using social media trying to make a policy to appease everyone in every hypothetical scenario."

> We don't want to set everything up, only to have it all shut down by the legal department.

Another policy issue that interviewees regularly noted related to concerns about negative comments, hacking, or "trolling," which could be posted to their social media pages. This issue was handled in a variety of ways, although most frequently it was addressed in health department policies. In one case, the IT department elected not to allow 2-way communication or comments on the health department page, a decision that stemmed from the legislature's concerns that inappropriate comments could become associated with the legislators themselves. Another interviewee explained their approach: "If someone comments on a Facebook post, we have to go through an approval process before we can say something back. If you don't reply to someone in a timely manner, they're not going to engage in a conversation with you on one of these platforms." Another health department decided that the official policy would be never to delete a comment unless it included offensive or hateful language and to respond to all comments, even the negative ones.

Regardless of the particular policies, as one interviewee explained, "We need to get more comfortable with the speed and rapid response necessary to engage with some of these tools in an effective way."

Local, state, and federal policies and support for platform use

Other interviewees cited challenges with mixed messages coming from different levels of both local and state governments. In health departments that were affiliated with the county government, or located in states with a strong central health department, coordinating support across different pillars of leadership proved more challenging. Often, those in leadership positions, at both the program level and health department level, as well as other staff who could see the value of having such programs, were supportive of implementing social media or mHealth programs. However, people working at the county or state levels were more apprehensive, perhaps worried about the implications for message control (ie, maintaining a consistent message from the government across all levels, particularly during an emergency), or liability for officials who might be held accountable even if they were not responsible for day-to-day messaging.

One interviewee expressed the importance of involving the county-level government in policy development, since they represent the county on their social media

pages. In a similar vein, another interviewee emphasized the importance of examining state policies about social media and mHealth programs and ensuring that LHD policies align with those state policies.

Many interviewees stated that if federal, state, or local government policies encouraged the use of social media and mHealth, health department leaders would be more apt to support exploratory and basic efforts to use these tools. Many underscored that government policies outside the health department do not even need to commit resources to LHDs for social media and mHealth efforts, but rather just encourage LHDs to take steps toward developing flexible and scalable programs.

CASE STUDY 2: Leadership at the Chicago Department of Public Health: Pioneering the Way for Social Media and mHealth Innovations

Since August 2011, the city of Chicago has embarked on an expansive mission to incorporate a public health action agenda for its residents. The Chicago Department of Public Health (CDPH) has played a key role in developing the Healthy Chicago agenda, a community health improvement plan that focuses on collaborations with partners and key stakeholders in the city. CDPH's involvement in the Healthy Chicago initiative has motivated them to use social media and mobile health technology. However, it is the encouragement and support of the health department's leaders that has been a primary factor in incorporating these platforms into the core functions of CDPH's activities.

In 2010, the health commissioner made social media an important priority of his administration. As one interviewee noted, the idea behind using social media is that the health department needs to be responsive: "It is a priority across the city to become more technologically 'with it,' and to make government more accessible and transparent."

Using Social Media to Foster Community Dialogue

The health department primarily uses Facebook and Twitter as its social media platforms for information dissemination. These platforms complement and support other communication channels at the health department (eg, the website), and both are used for 1-way and 2-way communication. The 2-way communication helps CDPH to connect with its residents and allows feedback on its public health initiatives.

During the 2012-13 flu season, CDPH organized a live tweet event to answer questions sent in by the community on Twitter. The questions were answered by the medical director of the immunization program. The campaign reached more than 177,700 people and garnered significant media attention; local networks carried notices before the Twitter chat and reported on it afterward, expanding outreach during flu season.

Similarly, the health department conducts various public education and awareness campaigns using social media. CDPH launched its "Prepare Chicago" campaign in

summer 2013. During National Preparedness Month in September, the preparedness staff at CDPH expanded the campaign by sharing pictures of their preparedness kits via Facebook and Twitter. The department also issued a "tweet of the week," which provided tips on how residents could stay safe during emergencies and suggested at-home resources and strategies for family and community preparedness. The event generated a lot of interest through various contributions and sharing of ideas for preparedness for use by individuals, families, and communities.

Developing Mobile Apps to Address Community Needs

In addition to expanding its use of social media, CDPH developed mobile applications for the community. CDPH has created multiple apps to provide residents with critical information about public health issues. For example, the Chicago Flu Shot app and the Back to School Immunization app provide Chicago residents with easy access to resources and information on vaccination sites and maps of clinic locations. In spring 2013, CDPH launched its Foodborne Chicago app, a first-of-its-kind tool that scans Twitter mentions for symptoms of food poisoning in the Chicago area. Once the information is collected, CDPH provides residents with a link that can be used to report and provide information on the food poisoning case. As a result of residents reporting cases via Twitter, CDPH has identified health code violations more quickly than via traditional inspection processes.

CDPH continues to produce innovative and resourceful information sharing with its residents. As an interview from the health department summarized, "Our goal is to reach Chicago residents where they live, work and play—in many cases this means innovative approaches. Today, if we want to make real progress in public health, social media must be a part of any public outreach or education campaign. This is the reality—take it seriously."

For more information: www.cityofchicago.org/city/en/depts/cdph.html

Suggestions and Requests

LHDs should share best practices and advance an evidence base

Some interviewees suggested that more evidence-based research demonstrating the value of social media and mHealth efforts would be effective in obtaining leaders' buy-in and support. As one interviewee explained, leaders' buy-in "comes from pulling in other organizations to say 'look what they're doing, look how they're reaching out to their community through these channels.'" For some health departments, it is not as easy to find comparable examples of the successful application of social media and mHealth programs, and some interviewees requested more evidence-based research, perhaps from a federal agency or other trusted sources, directed to health department leaders, demonstrating the value of these technologies. While some interviewees said no amount of research could convince their leaders, others felt their leaders would respond well to increased research and success stories regarding similar mHealth and social media efforts.

The majority of respondents indicated that increased coordination and collaboration between LHDs could demonstrate the benefits of platforms for emergency communications while also building in-house capacity. Arguing for the need to use these tools for emergency preparedness, one interviewee explained, "It's an important area of emergency preparedness. How can we deliver tools to not only help with communications but also with emergency preparedness messages and training? And how can you deliver it on their devices?"

Almost all interviewees indicated that their LHDs have some existing general collaborative effort ($n = 56$), more than half of which ($n = 38$) are at the local level. Examples of such collaborations included partnerships with CBOs that may work with specific populations, such as refugees or non-English speakers; relationships with healthcare providers that serve particular age groups, such as the elderly and those requiring home healthcare; and efforts with local schools. Many interviewees explained how coordinated efforts beyond their locality would be beneficial for social media efforts. For example, coordination with other counties, the state health department, or their counterparts in emergency

management would enable them to develop pre-scripted messages to use on social media sites or text campaigns before or during an emergency. Especially if state health departments circulate such messages to counties, concerns about misinformation or discrepancies in messages could be minimized, and fewer staff at each LHD would need to be involved in preparing and monitoring communications over social media.

Several interviewees also suggested that regional emergency drills should test the interoperability of different counties' and organizations' systems and approaches to collecting information using social media and mHealth tools. Some interviewees suggested that increasing access to after-action reports from drills or lessons learned from disaster management activities could help convince leaders that these tools can be of use to LHDs.

LHDs should share internal policies with other LHDs

While increased access to best practices and evidence can help LHD staff convince leaders that using social media and mHealth can be beneficial, interviewees also requested sample policies from other LHDs to guide their own health departments in ways to carry out efforts or allocate resources.

At some health departments, leaders became more comfortable with the idea of devoting resources to social media and mHealth programs once policies regulating the use of such programs had been established. Several interviewees noted that, in developing such policies, it was important to get health department–wide buy-in, so that all staff would feel responsible for and empowered to run and grow these programs. One interviewee explained that policies at their health department were developed based on input from administrative staff, programmatic staff, and the state health department, as well as from national-level guidance.

Overall, a health department policy was deemed by most as a critical foundation for the department's efforts to use social media and mHealth platforms, specifically to outline personnel responsibilities and indicate what platforms could be used and for what purposes. Many

interviewees explained how policies often shift during emergencies, and therefore department policies should cover platform use for daily operations as well as emergencies. For example, some requested that their health department develop an emergency social media plan and that such plans be coordinated with neighboring jurisdictions to improve consistency of messaging.

State and federal policies should encourage platform use at the local level

Local, state, and federal officials can support LHDs in building and sustaining programs focused on emergency preparedness and disaster management by implementing new policies and funding mechanisms. Several interviewees indicated that policies that support increased coordination and collaboration with other entities would support LHDs in more effectively using these platforms.

In reflecting on information management and crisis communications during Hurricane Rita, one interviewee noted that having numerous communication mechanisms for different populations proved challenging and therefore having one uniform message that can be quickly disseminated would be particularly useful in communicating critical life-saving information. Another interviewee recommended that counties nationwide develop single text programs or social media programs that can be used for all public health emergencies. Some interviewees explained that pre-scripted messages coordinated at the county or city level during recent events, such as the Derecho and Hurricanes Irene and Sandy, helped LHDs to focus on disseminating messages, since staff did not have to devote time to crafting and approving messages.

Interviewees generally emphasized 2 challenges when using platforms for emergency preparedness: managing numerous communication mechanisms for different populations and lack of coordination of messages from other public officials.

Interviewees suggested that state and federal agencies should support policies that encourage and fund the use of social media and mobile technologies. Moreover, as many interviewees suggested, if state governments took a more active role in circulating approved pre-scripted messages to local entities, tailored to specific platforms, specific audiences, and for specific stages of emergencies, it would support the use of mHealth and social media at LHDs where staff resources are often strained. As one interviewee explained, a larger entity could devote the same amount of staff time as a smaller entity to developing a social media or mHealth program, but the efforts of the larger entity would be more efficient since numerous smaller entities could benefit from their effort. Since LHDs have different processes for approving and vetting messages, pre-scripted messages would likely increase the timeliness of dissemination; support coordination of messages with partner agencies, such as emergency management personnel; and minimize concerns about misinformation, given the improved consistency of messages among public officials.

A few interviewees, serving different-sized jurisdictions, recommended that CDC modify the requirements of PHEP Cooperative Agreements to include earmarked funding for the use of new media and encourage the development of pilot programs. These interviewees explained, "If it is evident that the federal government thinks these tools are useful, and that they want local health departments to use them, or that they want to get everyone on the same playing field, then we can avoid wasting time to convince our bosses that it's worth doing or paying for." As PHEP funds often inform departmental decisions regarding staff training and resource allocation, prioritization or recognition of the importance and potential of these platforms from the federal government can strongly mobilize local efforts. Nevertheless, as one interviewee explained, "We can't cookie cutter this thing; it's going to be based on programs and jurisdictions, their priorities, and the manpower they have."

Some interviewees also recommended that CDC's OPHPR revise the public health preparedness capabilities used to provide national standards for state and local planning. Interviewees specifically suggested that the sections on emergency public information and warning and information sharing be revised to

> State and federal agencies should support policies that encourage and fund use of social and mobile technologies.

encourage use of new media, including social media and mobile devices. As one interviewee stated, "Our leadership decides what we are going to focus our time on based on what CDC says. If somewhere in those documents, CDC says, 'It's important for your health department to figure out how to use these tools,' then convincing leadership wouldn't be an issue. Encouragement to use social media or mobile health needs to come from the top, not the bottom." Such support from the federal level could have a profound impact on adoption of mHealth and social media at the local level.

> Use of social media or mHealth technologies has to be encouraged from the top down.

LEGAL AND SECURITY ISSUES

Legal and security issues are concerns around security of information and the application of legal guidance for mHealth and social media programs.

Leadership Factors
• The applicability of federal laws to LHDs is unclear
• Liability concerns can impede platform use
• Security concerns can challenge program expansion

Suggestions/Requests
• Federal agencies should provide LHDs with guidance on federal laws
• Public and private organizations should provide LHDs with resources to manage liability concerns

Key Factors

The applicability of federal laws to LHDs is unclear

Several interviewees raised concerns about the applicability of federal laws to LHDs' use of social media and mHealth platforms (n = 17). For instance, some interviewees mentioned the Healthcare Affordability and Portability Act (HIPAA) specifically (n = 9), often explaining that an impediment to the adoption of mHealth and social media programs grew out of a lack of understanding of HIPAA and how it might apply to using such technologies to share health information. While many LHDs cited concern about HIPAA, many

of those same organizations did not indicate a need to use or share personal health information. Moreover, the confusion over whether HIPAA would apply to a specific social media or mHealth effort would often prevent an LHD from carrying out such an effort. The fear of violating a federal law often influenced decisions regarding these programs and steered staff away from initiating programs. This challenge was augmented by confusion about the implications of HIPAA in light of varying health department affiliations with other agencies (eg, hospitals, county or state level governments, etc), state and local regulations, and the type of information being transmitted (eg, general public health messaging vs. individualized vaccine reminders).

One interviewee explained that the LHD was in the process of trying to evaluate its special needs registry and the potential to collect and possibly even share that information via a social media or mHealth platform. The interviewee expressed concerns about ensuring that the LHD would be meeting all the HIPAA guidelines for that list, as well as some confusion about the responsibilities of the health department versus non-health agencies in the local government, their ability to share the list, who qualified as a HIPAA-covered agency, and, specifically, how they could share that information during an emergency.

For both mHealth—specifically short message service (SMS) campaigns—and social media programs, interviewees expressed concern and confusion over when and how HIPAA might be applicable. Although HIPAA was the specific law most frequently cited by interviewees, many interviewees expressed a more general confusion about the legal issues surrounding the use of mHealth and social media (n = 30).

Another concern that several interviewees cited related to the Freedom of Information Act (FOIA) and state record retention laws. At LHDs where these issues were a concern, interviewees expressed discomfort that any information posted by a health department employee to a department social media page would be considered an official government statement. This means that the employee's statement would be subject to the same laws and held to the same standard of accuracy as official communications, such as a press release from

the governor's office. As one interviewee explained, "Everything we produce becomes a public document, a discoverable item, so there need to be policies and guidelines about what we put out."

> Guidelines and policies are needed because everything we produce through social media is a public, discoverable document.

In these cases, interviewees underscored the importance of developing a system in which public posts were approved by both communications staff and subject matter experts, and in which sites were actively monitored to ensure timely and accurate follow up to any questions or comments posted on the site. Nevertheless, some interviewees still felt hindered by such an arrangement, explaining that in today's world, LHDs often need to provide information quickly. A main advantage to sharing information via SMS and social media is the speed of dissemination, yet communications staff can be hindered by message approval requirements through legal or IT departments.

Liability concerns can impede platform use

Several interviewees expressed concerns regarding health department liability for discussions and information circulated on platforms, particularly social media (*n* = 24). For example, one health department explained that they did not pursue a social media effort to reach out to teens and discuss teen pregnancy prevention because of concerns that the platform would not be private enough and that department staff would not have enough control over the information shared. It was also unclear how much responsibility the health department would assume if discussions with end-users revealed personal information.

In another case, an interviewee expressed concern over the legal ramifications of users posting private information to their site. In this example, a nurse at a local hospital had shared protected health information regarding her husband in the course of her efforts to track down a case of potential food poisoning. Following that post, there were concerns at the health department about how to respond, their legal responsibility for protecting health information on their site, and the appropriate course of action.

The other major legal concern raised by interviewees related to the use of these platforms for 2-way communication between the LHD and constituents. Several interviewees relayed LHD concerns about the legal responsibilities of the health department to maintain social media and mHealth programs in the face of public expectations that the health department would regularly monitor and update their sites. As one interviewee explained, to effectively use social media platforms, staff must diligently monitor discussions and postings. Monitoring pages is especially important to minimize misinformation. As the interviewee explained, "What happens if you miss [the one post with wrong information]? What do you do to respond [when it's already been viewed by so many people or if you missed the opportunity to correct it when it was first posted]?"

Security concerns can challenge program expansion

Interviewees also frequently described general security concerns and the responsibility of the health department to ensure that accounts could not be hacked or accessed by anyone without specific authorization. Examples include concerns about people hacking into an LHD's system and obtaining client information, accidental release of client or patient information by employees, and general lack of understanding among employees as to what constitutes a security breach.

Few LHDs expressed an interest in collaborating with other healthcare entities, such as hospital systems, but all of those interested in using social media and mHealth platforms shared concerns about whether platforms would be "secure" enough to use in collaborative efforts. For social media, concerns focused on protecting people's identities when discussing sensitive subjects, such as sexually transmitted infections or mental health conditions, and clarifying ownership of the information shared on these platforms. For mHealth, concerns focused on ownership of information exchanged via SMS or mobile applications and how such information would be secured. The information exchanged via mobile applications is often housed by a third-party vendor, and many LHDs expressed confusion about whether such vendors are permitted to sell or circulate information.

CASE STUDY 3: Public Health – Seattle & King County: Taking Steps to Address Legal and Security Concerns for Text Messaging Initiatives

Since 2008, Public Health – Seattle & King County (PHSKC) has been using mobile technologies and exploring the legal, security, financial, and logistical implications of adopting text messaging programs. While many LHDs interviewed cited legal and security concerns as barriers to adopt mHealth programs, PHSKC has taken the approach of further researching such issues while still moving forward with their SMS practice.

PHSKC has moved past traditional barriers to mHealth programs, and their steadfast dedication to mobile technologies does not go unnoticed. Interviewees from PHSKC noted that there is no doubt SMS can be the right mechanism to reach people because it is a much more personal way, a custom direct service, to reach people during an emergency or with routine communication. While PHSKC also has a robust social media program, their staff has shown an interest and commitment to SMS programs, and, as one put it, "[We] don't want to put all [our] eggs in one Twitter basket." While PHSKC has identified legal and security issues as concerns, they have also proactively sought answers to those problems to maximize the benefits of multiple mobile platforms, particularly SMS.

PHSKC has taken several steps to address potential legal concerns when using mobile platforms, including working with their own compliance and legal departments, learning from other health departments and healthcare entities, and conducting pilot tests and research to help answer legal and security concerns. In developing opt-in text messaging programs for employees and the public, PHSKC worked with their legal department to ensure they understand how federal and state privacy laws guide best practices, particularly when it comes to protected health information. To better understand the barriers to adopting text messaging, PHSKC held monthly teleconferences with staff at other health departments and healthcare entities to learn how they approached legal and implementation issues that have come up when using mobile technology. The department has

also pilot tested several text messaging programs for preparedness and other public health areas.

Texting Emergency Information to Employees

PHSKC developed an Employee Emergency Text Messaging program after surveying employees to assess interest and potential participation. In 2012 the SMS service was implemented during ice storms when several clinic sites, as well as tens of thousands of residential homes county-wide, lost power. The event lasted 5 days with approximately 15-20 text messages sent out to approximately a third of PHSKC's staff who had opted to use the voluntary program on their personal cell phones. The text messaging program was opt-in for employees, and PHSKC proactively worked with unions to make sure they understood that the program was meant as an added benefit, not a burden or obligation. More than 250 employees responded to a postevent survey, and an overwhelming majority said that they found the service useful.

Tailoring Texts to Reach Vulnerable and At-Risk Populations

One of the advantages of using text messaging is that texts reach a wide demographic range and are particularly popular with low-income groups and communities of color. PHSKC has received awards for their work with Somali and other refugee populations and their tailored outreach to those groups. Other texting programs that PHSKC has piloted include an influenza vaccine reminder service. Parents of children receiving flu vaccines at a free mass vaccination clinic were sent text messages alerting them when it was time to get their children a second dose of vaccine in order to become fully immunized. A program launched in November by PHSKC aids Affordable Care Act health insurance enrollment by providing enrollment event information customized to a subscriber's ZIP code. King County residents are urged to text KING + their ZIP to 468311 for personalized information. A pilot program launching

in 2014 will send nutrition, physical activity, and stress reduction messages to interested teens who sign up for the service at their school-based health centers.

Research to Understand the Applicability of HIPAA

Perhaps the best example of PHSKC's inquiry into legal issues related to texting is an article in the April 2013 issue of the American Journal of Public Health* by 2 PHSKC staff and the prosecuting attorney of their county. While some LHDs cite the Health Insurance Portability and Accountability Act (HIPAA) Security Rule as the reason for their inability to move forward with public health text messaging programs, the authors provide 2 valid avenues by which public health professionals can work within the law. The first is to restructure text messages so that personal health information is removed. The second option is to retain only limited health information in the message but conduct a risk analysis to meet the other requirements in the HIPAA Security Rule and to mitigate risk to assure that the requirements of the Security Rule are being met. And PHSKC has developed a policy to guide program staff who have a reason to use text messaging. While no form of communication is ever entirely secure, PHSKC has paved the way for helping other LHDs abide by legal and security laws in their efforts to develop mHealth programs.

For more information:
www.kingcounty.gov/health/texting

Suggestions and Requests

Federal agencies should provide LHDs with guidance on federal laws

Interviewees from many LHDs, particularly from smaller health departments with limited resources, often explained that they did not have access to the legal resources they needed to ensure that they were operating within the somewhat murky legal restrictions imposed by federal laws, such as HIPAA and FOIA. Without the in-house capacity to research complicated laws and understand whether their practices were within appropriate legal bounds, many interviewees felt hampered by their lack of understanding of the legal landscape surrounding these technologies and were hesitant to use them further.

Many LHDs seek clarification from federal agencies on how existing laws related to the use of these technologies apply to their health departments. Interviewees often requested that federal agencies provide clarification, in the form of guidance that would explicitly outline laws relating to the use of these technologies to share health information and explain how these laws apply to LHDs specifically. Some LHDs have found that many laws, such as HIPAA, do not apply to them in most situations. Others have found that simply rephrasing a text message could change whether it is considered "protected health information" or qualified as a general update. However, for many LHDs, the only way to verify the applicability of federal laws is to consult legal resources. Nevertheless, a more comprehensive explanation of how and when federal laws apply to LHDs would benefit LHDs across the country in overcoming one of the largest perceived obstacles to adopting social media and mHealth programs.

While it is unknown exactly how various levels of government will regulate these new technologies in the future, many health departments have proactively sought to address legal and security issues, rather than allowing them to continue to impede the adoption of social media and mHealth programs. As one interviewee explained, even though there is a lot of hesitation in government to use social media because of liability concerns, "what guides us is what happens if we don't put something out, if something happens and we are not having a quick response? In the near future, that is going to be more of a liability."

Public and private organizations should provide LHDs with resources to manage liability concerns

If health department policies address legal concerns, program staff can mitigate the potential risks of using social media and mHealth. Such policies, interviewees frequently noted, protect not only the public and the department but also employees themselves. Interviewees explained that it is important to work with the legal department in implementing policies, to ensure that protected health information is not released or shared via text message. In seeking the advice of legal counsel, health departments have often been told that as far as liability is concerned, departments should: (1) respond to posts they are aware of; (2) set up a system to monitor pages; (3) put a disclaimer statement on the page explicitly stating that the page is not constantly monitored, and advising what the public should do if there is an emergency (eg, a phone number to call); and (4) demonstrate a good faith effort to respond to public posts.

Many interviewees stated that resources to inform policy development within their own departments would be useful. Such resources could include sample policies from other LHDs, guidance from other entities that details managing liability concerns for specific platforms, and pro bono or low-cost legal consultant services to vet concerns and health department actions.

Audience Factors
• Different platforms are used for different purposes
• Coordination and capabilities for 2-way communication are limited
• Platform use needs to be tailored to vulnerable populations
Suggestions/Requests
• Improve collaboration with NGOs and external entities
• Integrate mHealth and social media platforms into communications plans

AUDIENCES

Local health departments should identify the intended and targeted audiences at which to direct social media and mHealth programs, including those in different geographic locations and those considered vulnerable or at risk.

Key Factors

Different platforms are used for different purposes

Almost all interviewees indicated that their LHD uses one or more social media accounts, the most popular of which was Twitter; others included Facebook, Pinterest, Instagram, and LinkedIn. In contrast, few currently use mHealth programs. Of those with mHealth programs, the majority of efforts are SMS campaigns, and a few LHDs have developed mobile applications. There was general consensus among interviewees that different platforms best serve different needs. This is true not just for social media versus mHealth efforts, but also within each type of technology (ie, different types of social media platforms and different types of mHealth efforts).

Interviewees from rural, suburban, and urban areas all explained how social media was beneficial because of its ability to reach various parts of the community, spanning different demographics. In regards to geographic location, some interviewees explained that coverage and use of mobile devices was generally lower in rural areas, yet social media and mHealth efforts may be even more beneficial to these communities as they are likely to also have limited access to other resources. For some communities, social media and mHealth platforms play a more critical role in communicating with large groups in the community, as these platforms provide a way to work around other resource gaps. As one explained, "We are in such a rural area that there is no central meeting place for the community—no mall or anything of the sort—so virtual connections are the only way to communicate to large numbers of the community at once. This is why social media has become so important to our efforts." Another explained, "These platforms need to be seen as trusted sources."

The majority of interviewees also noted that various platforms are useful in particular situations: Twitter is best suited for quick, real-time information, whereas

Facebook is more appropriate for generating discussion and providing more in-depth, substantial information. Describing Twitter, one interviewee explained, "Information changes rapidly, and Twitter can send information out rapidly. It's a match."

Many interviewees discussed the benefits of using social media for public health

> Virtual connections are the only way to communicate with large numbers of people at once.

efforts and specifically for emergency preparedness. Some provided examples of how social media were effective in communicating key messages to specific populations as events unfolded or in anticipation of events, to help the health department stay "ahead of the curve." One county experienced a West Nile outbreak and anticipated several press inquiries, so they used their social media accounts to keep the public and media up to date on case counts and related information.

For some LHDs, as one interviewee described, their "Twitter presence is more of a media relations tool than anything because we can put out what we think they will ask and therefore save staff time from responding to inquiries." Similarly, 2 LHDs used Twitter and Facebook to send messages to at-risk groups, including students and parents, when local schools had tuberculosis and norovirus outbreaks.

Coordination and capabilities for 2-way communication are limited

Interviewees generally agreed that social media and mHealth platforms could be useful in engaging with communities and coordinating efforts with partners. As some noted, social media platforms are useful for sharing information on resources with other partners. A health department could post information on its Facebook or Twitter page that links to organizations that work with specific populations. Similarly, health departments can share vital information with these organizations that can be posted on the organizations' pages. Essentially, social media platforms enable health departments and CBOs to share information and messages and likely expand the number of people receiving messages, since organizations and health departments may have different followings. This can be particularly useful in urban settings where community members may be

overwhelmed by the numbers or locations of resources. For example, during Hurricane Irene, one LHD used Facebook to circulate information about the locations of Red Cross shelters and another used Twitter to circulate location information about the open medical facilities in a community. Some interviewees also explained how social media or SMS campaigns are useful to communicate with volunteers and help to organize their efforts. An interviewee at an LHD in California explained how using social media allowed them to quickly disseminate accurate information to volunteers during the Great California Shakeout, an earthquake drill to test emergency preparedness capabilities.

The majority of interviewees noted that the primary challenges for both social media and mHealth campaigns are that efforts are primarily used only to disseminate information, rather than to collect information and inform situational awareness, and that evaluating efforts is costly, time-consuming, and a low priority. Some LHDs identified ways that platforms are used for 2-way communication, but these efforts are limited to question-and-answer sessions about current public health concerns, such as food safety, flu vaccination availability, and clinic locations. For example, one interviewee explained, "It would be ideal to work in GPS capability so people can use maps to figure out where exactly certain services are available."

Many interviewees expressed an interest in advancing 2-way communication for disaster management so that social media or mHealth efforts can be used to collect information about real-time events, thus becoming a crowdsourcing tool to inform officials of on-the-ground needs.

Platform use needs to be tailored to vulnerable populations

Several interviewees noted that social media and mHealth are a "nontraditional way to reach vulnerable populations or people who can reach them." For example, one health department activated a text messaging campaign during Hurricane Sandy through which messages were sent out to community partners and CBOs informing them of what they could do to prepare for the storm and what information and resources were available to their communities. Other LHDs have developed social media pages or mHealth

campaigns that target specific groups, such as refugee populations, specific ethnic or age groups, or communities where there is limited proficiency in English.

LHDs that identified benefits of using these platforms to reach specific populations also explained challenges in initial development of programs, as well as maintenance, evaluation, and expansion of efforts. In regards to initial program development, some interviewees pointed out how disparities in mobile device and internet access can prohibit LHD efforts from reaching intended audiences. One interviewee noted, "We always need to be mindful of access—whether people can receive the messages we're pushing out." When developing a program or expanding services, many interviewees emphasized that LHDs need to first identify whether targeted populations have cell phones or other technology needed to access information, and then discern whether that information is available in formats that will actually reach the intended audience. For example, one health department developed mHealth programs for people with functional needs. Rather than offering an alert notification system in only 1 format, the health department offered it via SMS and phone calls to ensure that both deaf and blind populations could receive messages in an accessible format.

> We must always be mindful of access—can people receive the messages we are pushing?

Many interviewees also shared challenges in maintaining, evaluating, and expanding programs focused on vulnerable populations. Some interviewees explained that after an mHealth program was under way, they discovered that some low-income users had disposable cell phones (also known as "burner phones"). Phone numbers therefore become inactive after a short period, and many users do not notify health departments when their number changes.

Others underscored the importance of marketing programs, especially when they are intended to target specific audiences, explaining that "campaigns are only as good as their promotion." After creating social media pages in Spanish, one department saw little interaction with Spanish-speaking people because of insufficient advertising of the pages as an information resource.

CASE STUDY 4: Orleans County Public Health: Using Social Media in the Absence of Traditional Communication

Orleans County is home to an estimated population of 40,000 in the Rochester, New York, metropolitan area. The small county does not have a dedicated television or radio station, and the print media are located in 2 other counties. These communication limitations compelled the Orleans County Health Department (OCHD) to use innovative communication platforms to relay information to their community. As one interviewee stated, "Due to the limited gathering places throughout the county and central locations to post announcements, having social media sites helps us have a hub."

The health department first started using social media during the 2009 H1N1 pandemic in an effort to reach the community. Through that response, OCHD found that many people in the community already used Facebook, but, as with other Facebook groups and pages, promoting and gathering "likes" for the health department page was challenging. While OCHD develops its own social media content, it also shares useful information developed by other health department social media sites from across the country. As one interviewee explained, "Usually when I find out that a county has a Facebook or Twitter account, I will friend them so that I can follow them and see what they have. I will copy and paste stuff and put it on our pages, even with stuff from county health departments from across the nation, though always giving them credit." OCHD is still exploring innovative ways to use Twitter since its use in the community is still nascent.

As OCHD's social media use expanded, the health department created an inhouse Facebook page for its Medical Reserve Corps (MRC). Since MRCs are community -focused entities that are often housed in LHDs with a common goal of assisting the community during public health emergencies, the development of OCHD's MRC site was a logical next step. The OCHD staff uses the MRC site not only to provide education and support but also to focus on building community resilience (eg, increasing physical activity, kids health, healthy eating, safety, emergency preparedness, etc).

Local government policies currently restrict OCHD from using social media for 2-way communication, but the health department hopes to expand and further its social media in this area in the future. The staff monitors the platforms for comments and feedback, but they delete any direct communication on these platforms and follow up directly via e-mail with those entities. Because New York State community health assessments require data from health departments on community-based initiatives, the expansion of 2-way communication would help support and make the case for effective use of social media for community-based programs. While social media policies await development, OCHD encourages other county health departments to make use of social media platforms for community resilience.

For more information: www.ochd.org

Suggestions and Requests

Improve collaboration with NGOs and external entities

Interviewees generally fell into 2 categories: those with nascent efforts, primarily focused on social media, and those with advanced efforts, which were more likely to incorporate mHealth. Almost all interviewees underscored the need for increased interaction with nongovernment entities, such as industry partners or contractors, to address existing gaps in organizational capacity, such as inadequate staffing and limited technical expertise. However, LHDs expressed different interests regarding the types of partnerships they wanted to explore, depending on the extent of their platform use.

Some explained the current or potential role of contractors in designing and managing programs or serving as a resource for technical support. Others explained that, for some LHDs that do have the necessary resources to use platforms, the challenge might be more about ensuring the populations they serve have access to mobile devices. In order to improve communication with specific populations in areas prone to natural disasters, some respondents suggested that companies help to improve access to mobile devices among populations in low-resource settings. Industry support for translation services would also help LHDs reach populations with limited proficiency in English via both mHealth and social media platforms. As one interviewee explained, in just one of the counties they serve, "There are 150 languages spoken in the public schools, yet translation services almost seem to be a luxury, even though they aren't. We just have a shoestring budget."

Several respondents who have advanced mHealth or social media efforts expressed an interest in partnering with entities such as healthcare organizations, academia, hospitals, and CBOs. LHDs that demonstrated an interest in working with these entities were looking to expand and integrate their communication efforts with those who are outside of public health but play a key role in emergency preparedness. One interviewee noted, for example, that working with the local American Red Cross chapter to disseminate information about the availability

of shelters and relief services enabled them to reach multiple communities affected by devastating tornadoes. Similarly, another interviewee discussed how working with CBOs that serve specific populations, such as the elderly, racial and ethnic minorities, or hospice patients, allows their LHD to communicate critical information. Because CBOs have established relationships with the populations they serve, providing CBOs with life-saving messages for circulation via social media or SMS may be the best method of communicating with these populations.

Integrate mHealth and social media platforms into communications plans

As a few interviewees emphasized, health departments should not replace communication plans with the exclusive use of new media platforms, but instead should integrate their use into existing practices to expand the number and types of populations reached. As one interviewee explained, "We're not really being resilient if we don't prepare to have the mechanisms to communicate."

> We need to figure out how to reach people who are on the go.

Many interviewees emphasized that translation services and other resources that facilitate communication with people with limited proficiency in English and at-risk populations are necessary to build programs targeted to these audiences. As one interviewee explained, "The smartphone, iPhone, Samsung, whatever someone is using, contains their whole life. That's just going to continue to grow. People are moving away from desktops, and we need to figure out how to reach those people who are on the go."

Increased focus on advertising and marketing social media and mHealth efforts can also help LHDs reach targeted audiences, especially for health departments aiming to use platforms for 2-way communication and not just information dissemination. As one interviewee noted, "Just because you build a program doesn't mean people will use it." Similarly, another emphasized that "public health needs to have a mindset focused on consumers and buy-in. We need to be looking at how businesses and other health departments used social

media as examples of what we can do and how we can get people engaged." Resources that highlight how various entities promote their social media pages or mobile

campaigns are useful and can explain how a campaign was designed or how various platforms were used to address specific events and audiences.

Recommendations and Implications: Moving Forward in Policy and Practice

As highlighted by numerous interviewees, several roadblocks prevent local practitioners from capitalizing on the benefits of social media and mHealth platforms. LHDs can take steps to work around these impediments and advance their use of social media and mHealth. At the same time, policymakers can revise guidance and policies to support LHD use of these platforms and to more accurately clarify how federal laws apply to LHDs. While this study focused on the application of social media and mHealth for emergency preparedness, many of the recommended actions for policymakers and practitioners will support general uptake at LHDs. These recommended actions have been framed by the project team in light of the interviews in this study and analysis of relevant existing research.

BUILD IN-HOUSE CAPACITY

Practitioner Actions
• Assess internal baseline capacity and augment with support of external partners
• Expand existing communication plans
Policy Actions
• Promote creation of an information exchange database
• Identify ways to integrate local information sharing in a national-level system

Recommended Actions for Local Health Practitioners

Assess internal baseline capacity and augment with support of external partners

LHD leaders should take steps to better understand their department's baseline capacity to use social media and mHealth for emergency preparedness. Similarly, leaders should identify external resources that could help fill gaps in staffing and funding. For example, LHDs should reach out to telecommunications companies, such as Verizon and AT&T, and entities that host social networking services, such as Facebook and Twitter, to identify what technical support and training can be offered to LHDs. Additionally, LHDs can continue to build on regional efforts in preparedness and proactively partner with LHDs in their region with similar social media and mHealth needs. Health departments should identify CBOs and academic institutions that can offer pro bono or low-cost services, such as unpaid interns and contractual services, to fill staffing and training gaps.

Expand existing communication plans

LHDs should integrate social media and mobile technologies into existing communication plans. As many interviewees emphasized, these new platforms should not replace current communication mechanisms, but rather supplement current approaches in an effort to circulate information more rapidly and to wider audiences.

> New platforms should supplement, not replace, current communication systems.

Recommended Actions for Policymakers

Promote the creation of an information exchange database

As evidenced by numerous interviewee requests, a database or resource for LHDs to share examples of successful efforts, funding sources, or potential uses and applications of mHealth and social media would be extremely useful in helping LHDs identify best practices and uses for various platforms. State and local officials should work to form or support the creation of such a database to serve as an information-sharing mechanism for LHDs regionally.

Identify ways to integrate local information sharing into a national-level system

Federal agencies should support creating a database at the national level that joins these local efforts and potentially includes other key stakeholders, such as nongovernment and community-based organizations.

IMPLEMENT LEADERSHIP SUPPORT AND POLICIES

Many health departments struggle to get leadership buy-in to support social media and mHealth efforts. Lack of support from leaders is seen to be due in part to an aging public health workforce, with department leaders often being unfamiliar with how to use new technologies. However, policies at the local, state, and federal level must reflect current and future communication methods.

Practitioner Actions
• Learn from existing practices at other LHDs

Policy Actions
• Support research to improve the evidence base for technology use
• Develop methods to disseminate uniform messages
• Modify requirements for PHEP cooperative agreements
• Revise public health preparedness capabilities

Recommended Actions for Local Health Practitioners

Learn from existing practices at other LHDs

While it is optimal for LHDs to have access to a database to exchange information and ideas regarding platform use, LHD staff should take steps now to engage with and learn from their colleagues at other LHDs. As some interviewees noted, merely talking with colleagues in the next county's health department or at a health department with visibly advanced efforts can help guide staff in developing programs and establishing policies. For example, one interviewee explained how their LHD wanted to develop social media accounts to generate discussion around teen pregnancy. The health department did not have any social media accounts but contacted another LHD that had a teen pregnancy effort on social media, which then became, the interviewee explained, the model for the social media pages they developed.

Recommended Actions for Policymakers

Support research to improve the evidence base for technology use

While statistics indicate increasing and widespread use of social networking sites and mobile devices, LHDs lack the evidence base they often need to demonstrate the role of these platforms in advancing public health activities, including emergency preparedness. Policymakers should explore ways to incorporate this needed research into efforts that are already being funded.

Develop methods to disseminate uniform messages

To maximize the potential of social media and mobile technologies for crisis communication, state and local officials should take steps to improve information management. Several interviewees shared stories of how social media or mHealth platforms were useful to quickly disseminate information to the public. However, interviewees generally emphasized 2 challenges when using platforms for emergency preparedness: managing numerous communication mechanisms for different populations and lack of coordination with messages from other public officials. State and local officials should therefore take a more active role in developing and circulating pre-approved messages to local entities, including messages that are tailored for specific platforms, specific stages of emergencies, and specific populations. Uniform messaging can minimize the distribution of misinformation and also improve the timeliness of information, minimizing the need for staff to have to wait for messages to be approved before they are circulated.

Modify requirements for Public Health Emergency Preparedness Cooperative Agreements

CDC should modify PHEP requirements to mobilize local efforts to use social media and mHealth. As PHEP funds often inform LHD leadership decisions regarding resource allocation and staff training, prioritizing these platforms in PHEP requirements can support local use. Moreover, as funding drives actions, revisions to PHEP requirements will encourage LHDs to use social media and mobile technologies as part of routine practice.

Revise public health preparedness capabilities

> CDC should modify PHEP requirements to encourage and support use of social media and mobile technologies.

CDC's Office for Public Health Preparedness and Response should revise the public health preparedness capabilities used to

provide national standards for state and local planning. Interviewees specifically suggested that the sections on emergency public information and warning and information sharing be revised to encourage use of new media, including social media and mobile devices.

ADDRESS LEGAL AND SECURITY ISSUES

Several LHDs expressed concerns about liability and security of information, which often prevents health departments from using platforms. However, as a few interviewees noted, LHDs can also face liability or trust issues if they have information critical to the public but do not share that information in a timely manner. Other research confirms the confusion LHD staff have regarding how laws, such as the HIPAA Security Rule, apply to mHealth efforts.[29]

Recommended Actions for Local Health Departments

Identify resources to inform health department policy development

LHDs can take steps to address legal and security concerns while waiting for concrete policy actions. Health departments should be proactive in identifying resources, such as sample policies from other LHDs, guidance from other entities that details managing liability concerns for specific platforms, and pro bono or low-cost legal consultant services, to vet concerns and department actions.

Recommended Actions for Policymakers

Circulate guidance to LHDs regarding the applicability of existing federal laws

HHS and other federal agencies, as appropriate, should clarify how and when laws such as HIPAA and FOIA apply to LHDs in relation to the use of social media and mHealth platforms. Guidance should also direct LHDs to legal resources that they can use to verify compliance with laws. As one interviewee stated, "We don't have the legal resources we need to figure out what applies to us and what we should be worried about. If the government could just tell us where to look to get answers, then we could at least try to develop our programs. Right now, though, we are just afraid of breaking laws so we are avoiding doing anything."

Clarify how new technologies are regulated

Some LHDs expressed confusion about whether mobile applications and other mHealth programs can be regulated. Steps have been taken by the FDA to regulate medical mobile applications, but it remains unclear whether applications for public health and emergency preparedness will also be regulated. Federal agencies should clearly communicate to LHDs what types of technologies will be regulated and for what purposes.

> Right now, though, we are afraid of breaking laws, so we are avoiding doing anything.

SERVE ALL AUDIENCES

Given the ubiquitous use of mobile devices and social media sites, practitioners and policymakers should take steps to ensure that social media and mHealth programs are effective mechanisms to communicate with all populations, particularly those deemed vulnerable or at risk. Platforms can also be especially useful in coordinating and communicating with health department staff and other public officials. Many interviewees explained that policies need to reflect a vision for how technologies and platforms will be used in the future. As one explained, "We should think of what it is we want social networking sites and cell phones to be able to do during disasters, and then craft policies to make that happen." As another noted, the benefits of these platforms are not just in their ability to rapidly transmit information but to form virtual and online communities when physical communities are not accessible, such as during an emergency or in remote areas.

Practitioner Actions
• Identify key audiences and understand how they communicate.
• Increase coordination with CBOs
• Support system interoperability among programs and jurisdictions

Policy Actions
• Support resources to reach vulnerable and at-risk populations

Recommended Actions for Local Health Practitioners

Identify key audiences and understand how they communicate

While use of social networking sites and mobile devices is generally widespread, LHDs must verify that targeted populations have access to these platforms to ensure they are effective communication mechanisms.

Increase coordination with CBOs

LHDs often benefit from partnerships with CBOs that can circulate messages to specific communities on behalf of the health department or promote LHD accounts and programs. LHDs should therefore dedicate personnel and resources to building strong partnerships with CBOs that link to key communities, including vulnerable and at-risk populations, volunteers, hospice and home healthcare providers, and various age groups.

Support system interoperability among programs and jurisdictions

LHDs have an opportunity to leverage and collectively benefit from innovative social media and mHealth programs that are developed. LHDs should not only vet the information in their programs for credibility and subsequently use it to provide situational awareness, but they should also look to one another to share information during emergencies. Furthermore, development of mHealth programs that allow systems and devices to share data, whether among one LHD or many, should be encouraged.

Recommended Actions for Policymakers

Support resources to reach vulnerable and at-risk populations

CBOs and other organizations with strong ties to vulnerable and at-risk populations often disseminate information to these communities during disasters. While partnerships with these organizations are important, it is imperative that LHDs do not rely solely on external entities to reach these populations. Grants and policies targeting LHDs should enable health departments to use translation services and other resources. As many interviewees noted,

> We need to craft policy that supports our vision of how social media and mobile technology can serve the people we need to reach in a disaster.

lack of these resources inhibit their ability to develop population-specific programs using these platforms. Many LHDs aim to provide social media sites, SMS programs, and mobile applications in different formats to serve non–English speaking, deaf, and blind populations, but they need support to do so.

Conclusion

The more than 2,800 LHDs across the county serve their communities daily, and these organizations are uniquely positioned to not only provide day-to-day preparedness messaging to the public, but also to reach them during emergencies to communicate and enhance situational awareness. Despite the promise of new media and its widespread use by the public, many LHDs face roadblocks that prevent them from fully adopting social media and mobile technologies.

This study sought to identify what organizational factors LHDs perceive as influential in precluding or enabling their use of these platforms. Furthermore, this study shared the successes of LHDs that have overcome barriers to using social media and mHealth and the suggestions interviewees provided regarding how LHDs can be supported in advancing platform use. With the pressures from a society that is becoming increasingly mobile and from diminishing funding for preparedness programs, increased focus should be applied to additional efforts for LHDs to adopt and leverage such technologies to benefit public preparedness.

Appendix: Interviewee Breakdown

In total, the research team invited 126 LHD staff to participate in interviews, using the complete contact protocol consisting of 1 introductory email and request to participate, followed by 2 follow-up emails several weeks apart if no initial response was received. Of the 126 potential interviewees contacted, 65 (52%) agreed to participate and were interviewed, 10 (8%) agreed to participate but the project team was unable to schedule the interview, 20 (16%) declined outright to participate,

12 (10%) declined to participate but put us in touch with another employee to interview, and 19 (15%) never responded. An additional 61 LHD staff were contacted, though not using the complete contact protocol. In these cases, the research team elected not to send the first or second follow-up emails, typically because we had (1) found a more suitable contact, (2) already spoken with someone else at the LHD, or (3) experienced time constraints in the interview phase of the research.

Figure 1: Types of positions interviewed at the local health departments

Public Health Programming & Education (11)

Communications (8)

Public Information/Relations (15)

Communications & Public Information - Emergency Risk (19)

Social Media/mHealth (6)
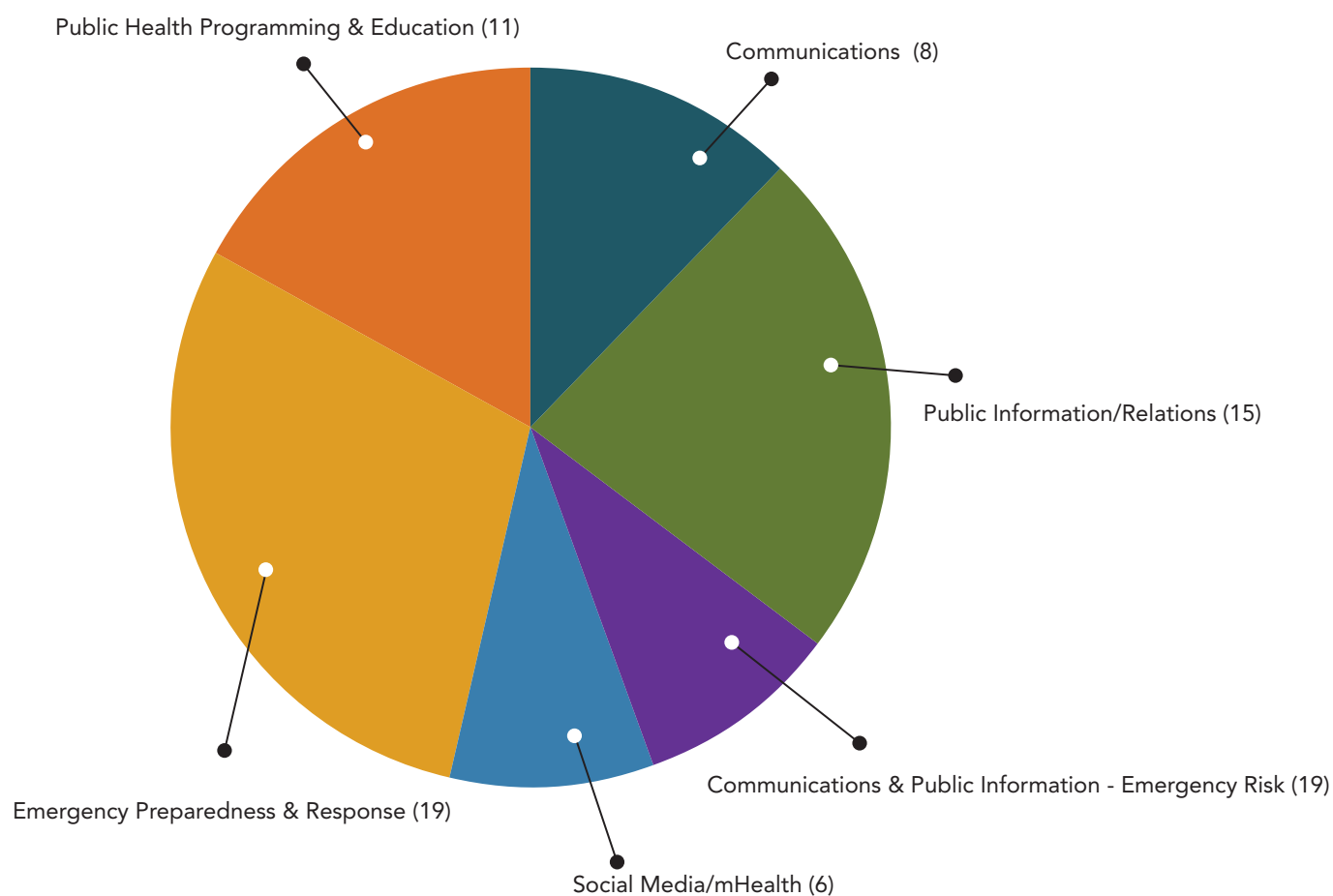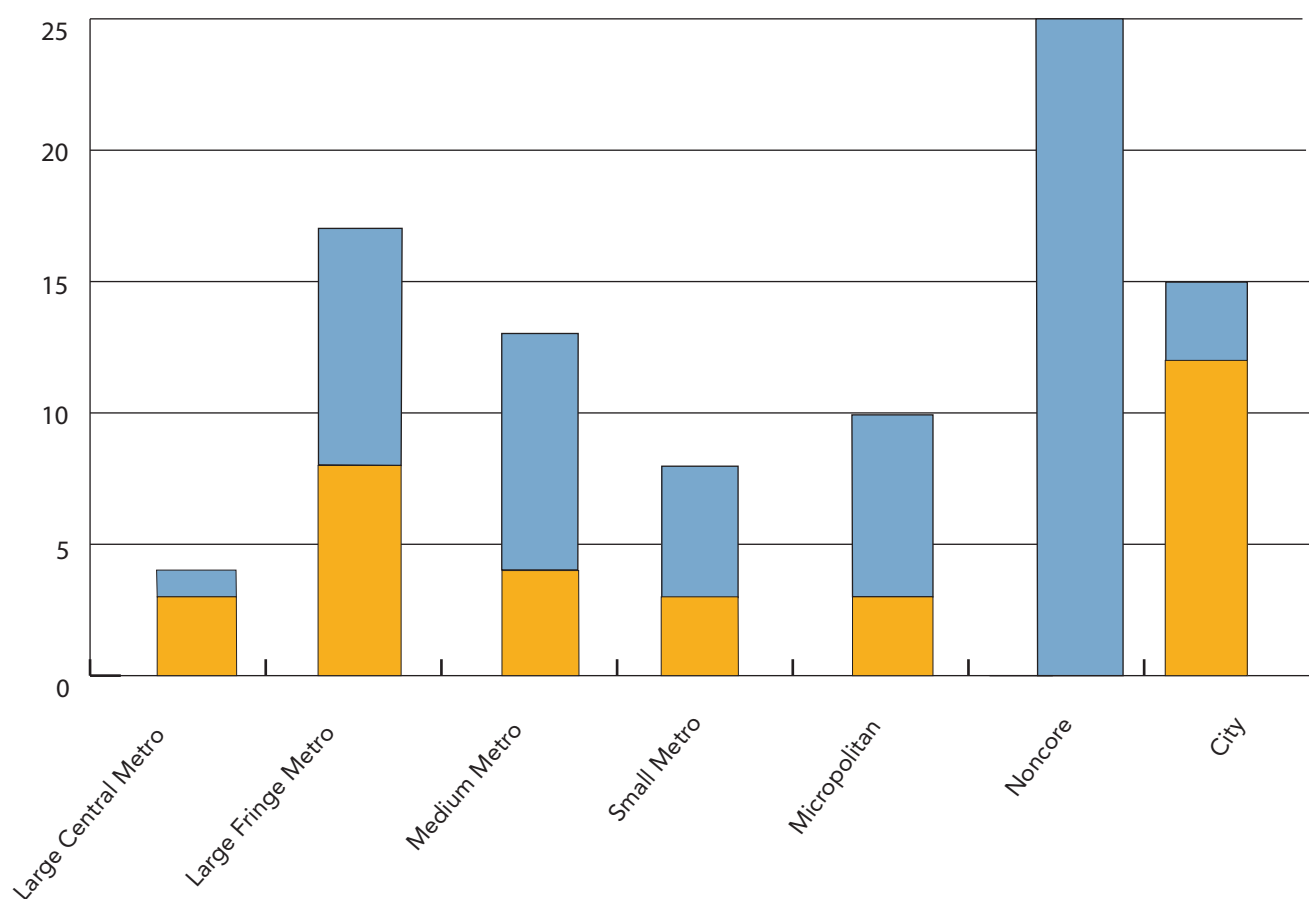
Emergency Preparedness & Response (19)

Figure 2: Types of size of health department jurisdiction represented by interviewees*

For more information about these county classifications, please see Ingram DD, Franco SJ. NCHS urban-rural classification scheme for counties. National Center for Health Statistics. *Vital Health Stat* 2012;2(154). Available at http://www.cdc.gov/nchs/data/series/sr_02/sr02_154.pdf.

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