



Coalition for Local Public Health

October 2010

The Coalition for Local Public Health is pleased to release “Local Public Health Response to H1N1 in Massachusetts”, a comprehensive after action report for the 2009 flu season. The report was compiled by the Institute for Community Health and funded by the Coalition.

Through this report the CLPH hopes to highlight the many valuable lessons learned during the H1N1 response. The CLPH remains committed to assisting local health departments in dealing with their many challenges through advocacy and education. It is our hope that this report will assist health department staff in learning about the issues that were taking place in all areas of the Commonwealth as cities and towns mobilized to respond to the need for mass vaccination.

Local Public Health Response to H1N1 in Massachusetts

July 30, 2010

AFTER ACTION REPORT/ IMPROVEMENT PLAN

**Study Commissioned by the
Massachusetts Coalition for Local Public Health**



Institute for Community Health

A collaboration of the Cambridge Health Alliance, CareGroup, and Partners Healthcare

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CONTENTS

Contents	4
Executive Summary	5
Section 1: Event Overview	9
Event Details.....	9
Participating Organizations.....	10
Section 2: Summary of Event and Evaluation Methods	11
Event Objectives, Capabilities and Activities.....	11
Evaluation Methods.....	13
Section 3: Analysis of Capabilities	15
Intelligence and Information Sharing and Dissemination.....	15
Planning.....	21
Epidemiological and Surveillance Investigation.....	26
Emergency Public Information and Warning.....	29
Risk Management.....	33
First Responder Safety and Health.....	36
Isolation and Quarantine.....	39
Mass Prophylaxis.....	41
Section 4: Conclusion	48
Appendix A: Improvement Plan	50
Appendix B: Major Events Timeline	60
Appendix C: Acronyms	62

EXECUTIVE SUMMARY

This report was commissioned by the Coalition of Local Public Health to document the experiences of local public health departments and boards of health in Massachusetts as they worked alone or together to prevent the spread of H1N1 in their communities. The study focused on how local boards of health planned for H1N1 outbreaks in their communities, the successes and challenges of implementing their plans, the solutions they developed to address unexpected challenges or limitations, and recommendations for improving local and state coordination and prevention efforts. Data collection included focus group discussions with local public health officials during emergency preparedness coalition meetings, review of coalition meeting notes and after action reports, and one-on-one conversations with state and local key informants. The outcome of the study is an After Action Report that local and state public health officials and municipal leaders may use in planning for future infectious disease outbreaks.

Summary of Event

The first outbreak of H1N1 in Massachusetts occurred during the spring of 2009. Uncertainty about the impact of H1N1 led many local public health, school, and municipal leaders within affected communities to close schools, cancel public events, and reduce as many risks associated with transmission as possible. When the outbreak subsided during the summer months, public health officials at the federal, state and local levels began planning for a major pandemic flu outbreak in the fall and winter months to come.

Most public health officials began with existing pandemic flu plans and assessed their relevance for the particularities of H1N1. Unlike most plans for mass vaccination of the general public, H1N1 was particularly prevalent and harmful in school-aged children, persons with compromised immune systems, and pregnant women. Planning for pandemic response began during the summer of 2009 with these target groups in mind.

Local public health officials, particularly public health nurses, worked with a wide variety of partners during the planning and implementation phases of the response. Schools and municipal leaders were primary partners in most, but not all municipalities. Many also engaged daycare providers, early intervention specialists, and community groups working with immune-compromised populations. The federal government made funding available to state and local public health leaders in order to support planning and response efforts. Public Health Emergency Response (PHER) funds were critical to the development of local and state capacity to respond effectively.

A timeline of events is included in the Appendix of this report. During the summer of 2009, most local public health officials focused on the implementation of mass vaccination clinics for the targeted populations and the general public. Prevention measures, including “Cover Your Cough” and “Wash Your Hands and Stay at Home if Ill” campaigns, distribution of health information about H1N1, and education about flu prevention resources (e.g., hand sanitizers) were also designed and implemented at various points in time. Local and targeted surveillance systems in some communities were put into effect. These and other measures were designed to reduce the spread of the virus until vaccine was available.

The anticipated date for large quantities of vaccine to be available for mass vaccinations was October 15, 2009. In early October, the Centers for Disease Control and Prevention indicated

that production of the vaccine was behind schedule and state and local communities should set additional priorities on which groups should be vaccinated first. In Massachusetts, the State Public Health Department, drawing on CDC guidance, identified priority groups as being children between the ages of 6 months and 24 years, pregnant women, caretakers of newborns and infants, and persons with severely compromised immune systems.

From mid-October through the beginning of December, H1N1 vaccine was slowly and disproportionately distributed across the state. Most local public health officials had to alter their vaccination plans to deal with smaller than anticipated allotments of vaccine. By early to mid-December, when large quantities of vaccine became available, the incidence of H1N1 outbreaks in Massachusetts had peaked and interest in vaccination was on the decline. Despite the delay, most local public health officials implemented their mass vaccination plans with varying degrees of success. Some modified their plans in response to lessons learned. Others developed new and innovative strategies for reaching the general public after realizing that their original plans would not be as effective as anticipated.

Throughout the 10 month period that this report covers, local public health officials described experiencing a myriad of challenges. The delay in vaccine production set off a wave of unanticipated problems, from the perceived loss of credibility of local public health to protect the general population to missed opportunities to vaccinate a large percentage of the population while concerns about H1N1 were still high. Despite the many challenges faced, Massachusetts health and public health providers achieved recognition from the CDC for having one of the highest vaccination rates in the country. Years of planning and partnership building, combined with an influx of funds to support public health infrastructure were essential to the success of providers in the Commonwealth in protecting the public from a major H1N1 outbreak.

Major Strengths

The major strengths identified during the 2009-2010 H1N1 flu season include:

- Massachusetts had one of the highest vaccination rates in the country. Local public health nurses, Medical Reserve Corp volunteers and other public health providers played a major role in vaccine campaigns across the state and administered more than a half a million doses of vaccine. Partnerships formed with elementary, middle and high schools to help local health facilitate mass vaccinations may underlie some of this success. Local public health officials reached out to constituents within their communities to offer vaccine through public clinics, popular community venues, and by appointment.
- Local public health officials drew heavily on existing all hazards plans to organize response to the H1N1 flu outbreak. Most utilized their emergency dispensing site plans to manage all aspects of their vaccine clinics. Just-in-time trainings for clinical staff, site plans, job action sheets, and “hot wash” questions were a few of the many elements within existing plans that were identified as being important to the success of clinic operations. Many reported learning from each public clinic experience and putting into practice lessons learned along the way. A number of focus group participants noted that previous planning efforts, including drills and exercises, helped to prepare local public health officials to respond to changing circumstances and to work more effectively with neighboring community health departments and boards of health.
- Public information and education campaigns to prevent H1N1 transmission were considered to be one of the most important and successful activities performed by local

and state public health. The CDC and MDPH were very effective in developing and disseminating H1N1 educational materials for key stakeholders, risk groups, and the general public. These materials reached the public in a variety of ways, including school and community email lists, backpacks of school-aged children, school and community websites, posters and flyers posted in public areas, and through outreach workers and community-based providers. Centralization of the development of educational materials was repeatedly noted as an important asset for local public health providers. PHER funding from the federal government was also essential to support the purchase of accompanying prevention resources in public spaces, such as hand sanitizer, dispensers, and soap.

- Established Volunteer Medical Reserve Corps (MRC) across the state increased the capacity of local public health providers to carry out vaccination efforts by ensuring the staffing necessary to conduct numerous clinics despite staffing shortages
- The Local State Advisory Committee (LSAC) and H1N1 Advisory Committee provided an opportunity for concerns about the H1N1 resources and response to be heard by the Public Health Commissioner and MDPH staff. The Commissioner and/or key staff attended meetings to discuss strategies and take input from public health leaders during the event.

Primary Areas for Improvement

Throughout the exercise, several opportunities for improvement in the ability of local boards of health and health departments in Massachusetts to respond to the incident were identified. The primary areas for improvement, including recommendations, are as follows:

- Improvements in the coordination and communication of resource requests and allocation within municipalities are needed. Local public health, healthcare providers, pharmacies and other designated vaccine administrators often did not communicate about vaccine requests and allocation during the planning stages and early weeks of vaccine distribution. Early stages of vaccine distribution also did not include advanced communication about formulations that were being sent to local public health. What resulted was a lack of situational awareness regarding successes and gaps in vaccinating the local population. A focus on relationship building and cross-disciplinary planning is needed
- Communication strategies between local and state public health officials may also be strengthened. Many local officials felt as though there needed to be more opportunities to provide input into MDPH's overarching response plans or to fully understand why and how decisions that affected them were made. There were also missed opportunities to share information and lessons learned from local and regional prevention and mitigation efforts. Clarity and consistency in communications between local and state public health should be a major focus of attention.
- Involvement of the media early in the planning stages was recognized as an important strategy for staying in control of risk communication to the public. A number of local public health officials spent an inordinate amount of time responding to inaccurate or inflammatory media stories and working with providers giving misinformation to their patients. Several communities that engaged local media sources early in the planning stages experienced a good, collaborative relationship that supported, not hindered, risk communication efforts.

Overall, local public health officials demonstrated capacity to effectively respond to H1N1 in Massachusetts. Early strategic planning efforts strengthened existing partnerships and brought new partners into local emergency planning and response arenas. The delay in vaccine production and distribution challenged some of these partnerships, as it impacted the credibility of local public health officials to implement agreed upon plans. It also shored up the lack of coordination and communication between local and state public health officials as well as among partners within municipalities and regions. However, many local public health officials reported their previous planning and preparedness capacity allowed them to be flexible and adapt to changing circumstances with vaccine distribution. This ultimately helped to bring partners back to the table and continue working together throughout the year. Local and regional partners were also effective in public education campaigns designed to mitigate the spread of H1N1 among high risk groups.

SECTION 1: EVENT OVERVIEW

Event Details

Event Name

Massachusetts Local Public Health H1N1 Response

Type of Exercise

Full Scale Real Event

Evaluation Start Date

August 2009

Evaluation End Date

May 2010

Duration

Approximately 10 months

Location

Local municipalities in the Commonwealth of Massachusetts

Sponsor

The study was funded by the Massachusetts Coalition for Local Public Health. The Coalition is comprised of the five public health associations in Massachusetts and includes: Massachusetts Public Health Association, Massachusetts Environmental Health Association, Massachusetts Association of Public Health Nurses, Massachusetts Association of Health Boards, and the Massachusetts Health Officers Association.

Program

Public Health Emergency Response Program

Mission

Prevent, Protect and Respond

Capabilities

Intelligence and Information Sharing and Dissemination
Planning
Epidemiological and Surveillance Investigation
Emergency Public Information and Warning
Risk Management
First Responder Safety and Health
Isolation and Quarantine
Mass Prophylaxis

Scenario Type

H1N1 Flu

Evaluation Team

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Institute for Community Health

Participating Organizations

Emergency Preparedness Regional Coalitions and Sub-Coalitions:

Sub-Coalition 1A: Berkshire County Coalition
Sub-Coalition 1C: Hampshire Public Health Coalition
Sub-Coalition 1D: Hampden County Health Coalition
Regional Coalition 2: Central Public Health Coalition
Sub-Coalition 3A: Northeast Public Health Coalition
Sub-Coalition 3B: Greater Lawrence Public Health Coalition
Sub-Coalition 3C: Upper Merrimack Valley Public Health Coalition
Sub-Coalition 3D: North Shore/Cape Anne Emergency Preparedness Coalition
Sub-Coalition 3E: Mystic Valley Coalition
Sub-Coalition 4A: Public Health Coalition
Sub-Coalition 4B: Metrowest Coalition
Sub-Coalition 4C: Boston Public Health Commission
Sub-Coalition 5A: Cape and Islands Coalition
Sub-Coalition 5B: Bristol County Public Health Coalition
Sub-Coalition 5C: Plymouth County Public Health Coalition

Participating Regional Sub-Coalitions included representatives from the following institutions and disciplines:

Local boards of health
Local health departments
MDPH
Regional schools
Universities
Medical Reserve Corps
Western MPHA
Emergency Management
PHEP
EMS
Hospitals
VNA

Number of Participants

- 4 Evaluators, including:
 - 1 Facilitator
 - 3 Observers
- 270 focus group participants representing approximately 180 towns
- 4 key informants

SECTION 2: EVENT AND EVALUATION OVERVIEW

Overarching Event Purpose and Goals

The overarching purpose of this event was to respond to, recover from and mitigate the effects of the Novel H1N1 Influenza virus. The focus of this report is on the local public health efforts in Massachusetts to achieve the following goals:

Goals for Local Public Health

- Play an active role in coordinated efforts to prevent H1N1 transmission.
- Provide accurate and timely information and guidance to MDPH, preparedness partners and the general public.

Event Objectives

- Bring local and regional preparedness partners together to plan for prevention and mitigation strategies, including the development of policies, acquisition and deployment of resources, and surveillance systems.
- Utilize and be accountable for PHER funds provided to prevent and mitigate the transmission of the H1N1 virus.
- Activate Logistics to receive and secure the additional Strategic National Stockpile (SNS) assets prior to distribution and demonstrate performance.
- Vaccinate Massachusetts residents using a tiered approach, focusing first on high risk groups and then the general public.
- Maintain safety and health of public and workforce.
- Provide timely information to the public, media, healthcare community, first responders, and other agencies and organizations statewide.

Scenario Summary

When the H1N1 virus emerged in many countries around the world during the Spring of 2009, health and public health officials quickly recognized the potential of the virus to have a devastating impact on local, regional and national communities. As mitigation and prevention efforts were launched, planning efforts for future outbreaks simultaneously began. In addition to public and professional education campaigns, the Centers for Disease Control and Prevention in the United States also created important funding opportunities for state and local governments to support their planning, prevention, intervention, and surveillance efforts. The most notable financial support to state and local governments came through the Public Health and Emergency Response (PHER) Phase II funds, which states applied for through a grant process. The purpose of PHER Phase II funds was to:

support and enhance the state and local public health infrastructure that is critical to public health preparedness and response, such as strengthening and sustaining the public health workforce; increasing laboratory capacity and capability; strengthening disease surveillance activities; planning and implementing possible large scale mass vaccination activities; developing effective public and risk communication guidance; developing effective community mitigation guidance; purchasing and procuring personal protective equipment, antivirals, and other pandemic related purchases for protecting the public health workforce; training and education of the public health workforce; community and personal preparedness activities; and addressing gaps and other public health preparedness challenges related to public health preparedness and response to an influenza pandemic (US DHHS, 2009).

In Massachusetts, an estimated \$4,973,437 was received to support H1N1 planning and response. All municipalities in Massachusetts received some percentage of this funding to plan and implement H1N1 prevention and mitigation efforts, including mass vaccination and public education campaigns. MDPH utilized the 15 established emergency preparedness coalitions across the state to distribute funding to local boards of health. Each coalition received an amount of funding based on population size. Coalitions were responsible for determining how to distribute the money to local boards of health. In most cases, the money was divided by using a formula similar to the one used for Public Health Emergency Preparedness funding. One coalition divided up the money regionally and at least one decided to hold the money centrally and request funds as needed.

Local boards of health were primarily responsible for developing and implementing strategies for preventing the transmission of H1N1, mass vaccination activities, public education and risk communication strategies, and ensuring a competent and adequate workforce to carry out strategic plans. Mass vaccination plans were to be implemented in a tiered approach, with high risk populations targeted first, followed by the general public. High risk populations included children under the age of 18, caretakers of infants, pregnant mothers, persons with serious health conditions, and healthcare workers.

In early October, the CDC and MDPH indicated that there was a shortage of mercury-free Novel H1N1 influenza vaccine for children six months to eight years of age and pregnant women. Shortly before this announcement, the CDC reported that the makers of Tamiflu® acknowledged limited commercial and stockpiled supplies of the oral suspension. During this period, the incidence of H1N1 in Massachusetts had increased, raising concerns among targeted and general populations that we were on the brink of a major public health crisis. Public anxiety was high. Local public health officials were inundated with calls from constituents, municipal leaders, and emergency managers. Although some preparations had been made to support public communication efforts, the magnitude of the number of calls was unexpected.

Throughout the month of October and into November, the distribution of vaccine supply was narrowed to the target high-risk populations. Prioritization of vaccine distribution required frequent review during the temporary shortage. By mid- to late November, more vaccine became available and was distributed in increasing amounts to requesting local public health departments or designees. Many local public health agents began implementing the plans they developed in August and September. This included targeted clinics in schools, daycare centers, and by appointment in designated areas. To accommodate need for additional staff many communities utilized their Medical Reserve Corps (MRC).

Large scale public clinics did not begin in most communities or regions until December, with the majority held shortly after the holidays in January. By this time, MDPH had revised its estimate of the amount of flu-like illnesses from widespread to regional activity, and then from regional to local activity. The reduction in estimates of the number of persons affected by H1N1 led to smaller than anticipated numbers of people at public vaccination clinics. Local public health officials in many communities developed new and innovative ways of getting vaccine out to the public. Vaccination efforts continued through April of 2010.

PHER funding helped to build the capacity of local public health agents to respond to a highly infectious influenza. Funding was largely used to support staff and volunteers to coordinate, implement and account for prevention strategies, including vaccinations. Many also used funds to build their long-term capacity for large vaccination efforts by purchasing needed resources, such as refrigerators, signage, hand sanitizer and dispensers, and appointment scheduling software.

Participants in focus groups resoundingly agreed that their ability to respond to H1N1 would have been severely limited if not for an influx of funding and MRC support to expand their capacity. With one of the highest vaccination rates in the country, local public health officials across the Commonwealth demonstrated leadership, ability and a level of preparedness to effectively respond to public health emergencies.

Evaluation Methods

In March 2010, the Massachusetts Coalition for Local Public Health (CLPH) contracted with the Institute for Community Health to conduct a statewide assessment of the local public health response to H1N1 and prepare findings in an After Action Report. The objectives of the Local Public Health H1N1 study were to gather information about local public health planning, organization, coordination and implementation of strategies to prevent and mitigate the spread of H1N1 in local communities, and identify strengths, areas in need of improvement, and recommendations for future events.

ICH worked with CLPH members to develop a plan for gathering input from local public health officials regarding their experiences with H1N1 planning and implementation activities. The decision was made to gather qualitative input from local public health officials through focus group discussions with each of the 15 emergency preparedness coalitions across the state. ICH drafted a series of focus group questions and circulated them to the CLPH members for review. Feedback was obtained and incorporated into the guide.

Between March and May of 2010, ICH reached out to every regional emergency preparedness coordinator and/or host agent to discuss a time to come out and conduct the focus group interviews. Twelve of the fifteen coalitions set aside time during their regional coalition meetings for ICH to facilitate a focus group discussion. Three coalitions had either already conducted an After Action report for their response or had arranged for an independent contractor to conduct one for them in the near future. ICH was able to attend two of the three discussion sessions among this group. The third sent us their after action report for review and made time available to discuss any additional questions with the emergency preparedness coordinator. All focus group discussions conducted by ICH were audio-recorded and transcribed. Notes were also taken at each of the interviews. Discussion notes were the primary source of data from two of the three focus group discussions that ICH attended, but did not lead.

Once interviews and notes were transcribed, they were imported into NVIVO 8, a qualitative data management program that allows for large quantities of data to be coded, reviewed, and analyzed. Two members of the evaluation team took responsibility for coding all qualitative data and analyzing the data to identify salient themes and subthemes. The results of this analysis were complemented by additional information learned from conversations with MDPH officials, various types of media coverage during the event period, and reports generated by national public health organizations (e.g., CDC, NACCHO).

Once an initial analysis of the data was complete, the evaluation team reviewed the Target Capabilities List (TCL) developed by the US Department of Homeland Security and selected capabilities that were most commonly described by focus group participants as being important for their planning and response efforts. Based upon the focus group discussions, the evaluation team identified the following capabilities to highlight in this report:

- Intelligence and Information Sharing and Dissemination
- Planning

- Epidemiological and Surveillance Investigation
- Emergency Public Information and Warning
- Risk Management
- First Responder Safety and Health
- Isolation and Quarantine
- Mass Prophylaxis

It should be noted that these capabilities are not the only ones utilized by local public health practitioners. They are, however, the ones that most frequently came up during the course of our discussions.

SECTION 3: ANALYSIS OF CAPABILITIES

This section of the report reviews the performance of the capabilities, activities, and tasks that were identified by local public health practitioners as being needed for H1N1 response in their communities and regions. In this section, observations are organized by capability and associated activities. The capabilities linked to the Massachusetts Local Public Health H1N1 Response are listed below, followed by corresponding activities. Each activity is followed by related observations, which include references, analysis, and recommendations. Descriptions of each capability are included in the beginning of each section and are taken from the U.S. Department of Homeland Security's Target Capabilities List: A Companion to the National Preparedness Guidelines (2007).¹

Capability 1: Intelligence and Information Sharing and Dissemination

The Intelligence and Information Sharing and Dissemination capability provides necessary tools to enable efficient prevention, protection, response, and recovery activities. Intelligence/ Information Sharing and Dissemination is the multi-jurisdictional, multidisciplinary exchange and dissemination of information and intelligence among the Federal, State, local, and tribal layers of government, the private sector, and citizens. The goal of sharing and dissemination is to facilitate the distribution of relevant, actionable, timely, and preferably declassified or unclassified information and/or intelligence that is updated frequently to the consumers who need it. More simply, the goal is to get the right information to the right people at the right time.

For this capability, we focus specifically on the communication and information sharing systems that were established between the Massachusetts Department of Public Health and local boards of health as well as between local boards of health and municipal leaders. Information sharing and dissemination to the general public is described in Capability 4: Public Information and Warning.

Activity 1.1: Develop and maintain plans for sharing information with all pertinent stakeholders across all disciplines through a clearly defined information sharing system

During the summer of 2009, the MDPH solidified its plans for sharing information with local public health officials, healthcare providers, and others responsible for the prevention and mitigation of H1N1 infections. The general plan entailed four primary activities. The first was to host a series of regional meetings across the state in order to communicate the general prevention plan for the Commonwealth and provide guidance to local health and public health providers as they plan for local response. A second communication strategy was the establishment of weekly conference calls for all providers in the state. Organized and run by MDPH, the purpose of these calls was to disseminate information in a timely manner to local providers, including epidemiological data, priority target groups, guidance on plans for prevention and vaccination efforts, and updates on the allocation and use of PHER funding. Third, information on a variety of topics related to H1N1 was emailed to local health and public health providers on an as-needed basis. Much of the information that needed to be sent to local public health officials was distributed via regional emergency preparedness coordinators. The fourth strategy was to create a H1N1 advisory committee made up of all stakeholders to deliberate process and best practice options throughout the pandemic.

At the local level, public health leaders identified key personnel that needed to be involved in

¹ U.S. Department of Homeland Security. (2007) Target Capabilities List: A Companion to the National Preparedness Guidelines. < www.fema.gov/pdf/government/training/tcl.pdf>

vertical and horizontal communications about issues related to H1N1. Most reported starting with their local emergency management structure and adding new partners as appropriate and needed. New partners often included school and district school officials, school nurses, and medical reserve corps coordinators or leaders. During the summer, local planning groups decided upon how often to meet, meeting formats, and best strategies for keeping each other abreast of new information.

Activity 1.2: Vertical flow of information

Throughout the 2009-2010 H1N1 season, MDPH implemented the strategies described above to ensure vertical transmission of information from the State to the local levels. Conference calls and email communications were the primary strategies for pushing information from MDPH out to local public health leaders. At the conclusion of each conference call, time was set aside for participants to ask questions of state public health leaders, request clarity on guidance, and share information learned at the local level. MDPH also established a “help line” that providers could use as needed to ask questions about H1N1, from clinical to logistical issues. Finally, MDPH representatives were present at monthly Local State Advisory Council meetings, public health association meetings, and targeted forums to share information about vaccine safety, state distribution plans, epidemiological data, and other topics of interest.

Activity 1.3 Horizontal flow of information

Local public health officials developed a variety of strategies to share information about H1N1 planning, prevention and response to other key personnel within their municipalities. At least several communities within each coalition reported setting up regular meetings with municipal leaders, school officials, emergency managers, and other essential public safety and community personnel. A few communities set up early morning briefings that occurred daily to discuss issues related to H1N1. Most established weekly meeting schedules, with the ability to bring people together in between meetings to discuss urgent matters.

Email was also used as a strategy for communicating with key personnel throughout the H1N1 flu season. In some cases, local public health officials served the role of disseminating information from MDPH to local responders. Initially local public health leaders who took on this role forwarded all information received from MDPH and the CDC to local partners. However, most found that there was too much information to disseminate, some of the information was redundant, and some was unnecessarily complicated. Several communities utilized a portion of their PHER funding to hire a coordinator that helped to filter and organize information coming from various sources. Some also developed H1N1 web sites which linked to individual town departments. Information that was most important to disseminate to key personnel was synthesized and communicated as needed.

In addition to regular municipal meetings, local public health officials also spent countless hours responding to personal telephone calls and emails from municipal leaders, school officials, first responders, and other key personnel. With a continually changing scenario at the federal level regarding funding, vaccine production and distribution, local public health officials were essentially “on call” in most communities throughout the fall and winter months.

Observations and Analysis

Participants generally reported that the communication strategies developed during the planning phase were effective in getting information from the state to local public health officials and from local public health officials to local partners. Very few participants raised concerns with the overall communications strategies that MDPH or their local communities developed.

During the planning phases, however, several participants indicated that they would have liked to see more engagement of practitioners from health and public health disciplines involved in the development of the state-level communications strategy. They would have also liked to see protocols developed to support more timely communication of press releases and announcements to the public. Specifically, many would like to see a policy put into place that would require press releases related to public health topics to be sent via email or the HHAN to all public health officials before being sent to major news outlets. If prior dissemination is not possible, they would at least like them to be sent simultaneously so that preparations can be made at the local level for dealing with questions from the public. Although not explicitly stated, some alluded to the need for more general agreements to prioritize the communication of press releases between local and state public health officials.

Local public health officials by-and-large found the systems set up to communicate information from the state to the local level to be sufficient for top-down dissemination. Weekly conference calls were particularly useful for getting updates on vaccine delivery dates and strategies, prevention resources, and epidemiological updates. Information disseminated via email was also useful, but many reported feeling overwhelmed by the volume of information and, at some point, stopped reading some or all communications.

An area of strength in state to local communications was in the dissemination of educational information and prevention materials for the public. The availability of educational materials and resources and concerted efforts to get these to local boards of health in a manner that could be easily adapted for local contexts was an important asset.

An overarching challenge faced by local public health officials was a lack of information about the State's plan for H1N1 response. Local boards of health were required to submit their mass vaccination and response plans to MDPH, but there was no reciprocal communication of the State's plans for coordinating, distributing, and tracking vaccination and prevention efforts. This lack of understanding made it difficult for some to assess the utility and appropriateness of local plans in relation to the State's plans. Large municipalities in particular noted the importance of understanding the State's overall strategies so that they can ensure synergy with plans and programs.

One of the results of a lack of information about the State's overarching plans for prevention, vaccine distribution, and mitigation was that it left many local public health officials feeling reactive rather than proactive within their communities. While participants from several coalitions acknowledged that the MDPH and the CDC had to grapple with a fair amount of uncertainty about the epidemic as well as critical resources to effectively respond and prevent outbreaks. Local public health officials felt that the uncertainty was not communicated clearly, nor were the reasons for change in plans and strategies as a result of changing circumstances. A common example provided here was when MDPH decided to expand the distribution of vaccine to as many providers as possible in order to increase vaccination capacity. Local public health officials were unaware of this decision and spent countless hours dealing with questions from the public regarding why, for example, they were able to pay for H1N1 vaccine at a pharmacy but unable to receive it through the public health department. A few participants noted that communications did improve over time. Better communication of decisions made by MDPH improved the ability of local public health officials to adjust their own plans as well as to communicate to municipal leaders and the public.

A second challenge was a lack of clarity and consistency in communications from state to local communities. This included clarification regarding who was responsible for sending information

out to school officials, emergency responders and managers, and healthcare providers. Several participants noted that there seemed to be a need for more collaboration and communication between MDPH and other state-level agencies whose constituents were affected by H1N1. A common example of this was the discrepancy between MDPH and the Department of Education regarding the temperature at which a child would need to be sent home or not allowed into school. While the CDC and Department of Education sent out guidance that a temperature of 100 degrees or higher was a risk factor, MDPH's guidance was 100.3 degrees. This created conflicts in some communities between public health leaders and school nurses, and between school nurses and parents. Risk factors or indicators need to be agreed upon at the highest levels and clearly and consistently communicated to all persons affected by decisions.

One of the biggest challenges faced by local public health officials was the media. The consistent focus on worse-case scenarios locally and around the country fueled concerns among the public during the early fall months. These concerns were exacerbated by delays in vaccine distribution to the Northeast. When the national news featured stories in early October of vaccine clinics that were set up Florida airports or mass vaccination clinics in Texas, local public health in Massachusetts had not even begun to receive vaccine. And when it did start coming, the allotments were too small to follow through on established plans. Direct and timely information about the federal and state distribution strategy would have been very helpful for local public health officials. Local public health officials repeatedly requested improvements in the MDPH's role in communicating information to the public via major news networks about vaccine production, distribution, and target groups. Clear consistent messages from state leaders would have helped local public health officials explain the delay in vaccine availability within a larger context rather than leave them open to accusations of incompetence in protecting the public.

Each coalition identified the one-way flow of information from MDPH to local providers as missed opportunities to gather local intelligence about the epidemic from the front lines. As one participant noted, "The whole point of the local perspective is to take the information and expertise of those in the field into consideration when making determinations on a state level." Several participants described circumstances where they had information to share with MDPH about the unfolding of the epidemic or public myths and concerns about the vaccine but did not know who to channel the information to and where it would go once communicated. Some thought the Help lines may have been designed for that purpose, but few felt confident that it was an appropriate mechanism. Feedback loops should be planned for in the beginning of every public health emergency.

Regular communications and transparency in decision-making were identified as two of the most important elements to successful horizontal information sharing within local communities. In most communities, municipal leaders encouraged local public health officials to play a lead role in setting up and facilitating communications within the community. Early engagement of key personnel that would likely be impacted by H1N1, such as school officials, school nurses, daycare providers and emergency managers was critical for the establishment of strong working relationships. Some partners were new to emergency planning and needed additional guidance on emergency preparedness concepts and plans. Investing time in ensuring that partners have the same general understanding of the scenario and the goals that need to be achieved is critical.

As noted above, there was a large volume of information that flowed from the federal to state to local levels. During the planning phase when individuals were getting oriented to the situation and developing plans based on intelligence from federal and state officials, much of the information was reportedly reviewed carefully. However, once the anticipated scenario began changing due to delays in vaccine production, the flow of information increased. Some reported a burden with

redundant information while others noted challenges in keeping track of continually shifting guidance and updates. Local public health officials who established good communications networks within their communities found that having a central person be responsible for reviewing communications, synthesizing key points when appropriate, and highlighting alerts was critical to prevent “information overload.” Hiring or designating a trusted, reputable person to take on this role helped ensure that key personnel got the information they needed rather than simply tune out.

In municipalities with good working relationships with healthcare providers and school officials, checks and balances regarding information that was used to establish policies and procedures or shared with the public was critical. Several local public health officials noted that there were occasionally differences between state-level agencies with respect to the information communicated and that these differences posed challenges when relationships at the local level were not strong.

By and large local public health practitioners noted that communication between local public health and healthcare providers within their communities was the weakest link. Very few reported knowing who was receiving vaccine, when vaccinations began, and who was reaching the target populations during the early weeks of vaccine distribution. This lack of knowledge made it very difficult for local public health officials to alter their own vaccination plans when confronted with less vaccine than anticipated. In order to be efficient in reaching target populations, working in coordination with local pediatricians and OB/GYN providers would have helped inform decisions about where to prioritize initial vaccination efforts. MDPH did eventually provide local public health officials with information about where vaccine was distributed within their communities. In the future, having this information along with the type of formulations being delivered to providers once vaccine becomes available could help with the planning and development of coordinated vaccination and redistribution plans. However, even with this information, relationships with local healthcare providers need to be in place so that coordination and collaboration can occur. This is especially important when resources are scarce and/or plans need to change in response to new intelligence.

Another noted weakness with horizontal communications was with the business community. A small number of local health officials with large corporations located within their communities did reach out to key personnel to assess whether or not they would be responsible for vaccinating employees. One community also had the location of a corporation identified as an EDS site, and necessarily included key personnel in horizontal communications. However, many participants identified a need to outreach to central business leaders who could be responsible for ensuring that critical information is disseminated to business owners. Increased communications with business owners may help them strategize how to support prevention efforts, maintain a healthy workforce, and ensure a Continuity of Operations Plan (COOP) is in place.

Recommendations

The following recommendations were provided by local public health officials regarding the plans and strategies for vertical and horizontal intelligence and information sharing:

1. Include local public health representatives in the planning of communication strategies from the federal to state to local levels.
2. MDPH should develop protocols during the planning stages to ensure that key intelligence is communicated to local public health officials and other emergency responders before being disseminated to the public via news outlets. Continue to utilize existing entities, such as the LSAC and CLPH to disseminate information
3. The HHAN was under-utilized as a strategy for quickly communicating information and

updates to local public health officials. The HHAN is an existing resource that could easily be used to issue alerts and notifications to public health officials. Future steps may include ensuring that local public health officials, including board of health members, have HHAN accounts and are trained to receive and retrieve information transmitted via the HHAN.

4. MDPH should expand its outreach to other state-level agencies to ensure that consistent messages are being transmitted to all persons at the local level who are impact by a public health emergency. In public health emergencies, MDPH should take a lead role in ensuring that affected agencies, such as the Department of Education, the Massachusetts Medical Society, and Massachusetts Emergency Management Agency, are consistent in their communications. This is a primary way to ensure that information communicated to the public is consistent.
5. Consistent and on-going communications across all levels of government and between key personnel within communities is essential for ensuring that protocols and procedures are followed, plans are up-to-date and appropriate for implementation, and messages to constituents are consistent. Communication strategies, including frequency of meetings, meeting formats, emergency contact information and preferences should be discussed early in the planning stages of a public health response.
6. Transparency in decision-making across all levels of government is critical for a consistent response within and across communities. MDPH needs to provide local public health officials with more information about planning and response decisions as do regional and local leaders within communities.

Capability 2: Planning

Planning is the mechanism through which Federal, State, local and tribal governments, non-governmental organizations (NGOs), and the private sector develop, validate, and maintain plans, policies, and procedures describing how they will prioritize, coordinate, manage, and support personnel, information, equipment, and resources to prevent, protect and mitigate against, respond to, and recover from Catastrophic events.

Activity 2.1: Conduct strategic planning

Early strategic planning was a noted strength in among participating local public health officials. In communities with confirmed cases of H1N1 in the spring of 2009, strategic planning began almost simultaneous with the initial outbreak. However, the majority of planning activities in preparation for the fall and winter outbreak began during the summer of 2009. Local public health practitioners described a broad range of community partners who were brought together for strategic planning purposes. Given the epidemiology of this strain of influenza, school-aged children were among the most adversely affected. As a result local public health officials focused their initial and primary partnership building efforts with schools, and to a lesser extent daycare providers and pediatricians. Partners within schools often included leaders, either a superintendent and/or principal, but also school nurses. The majority of schools targeted for participation in strategic planning efforts were middle and high schools, although elementary schools were the target in a large number of communities. Many communities with college campuses also included administrators and lead nurses in on-campus health centers. Most local public health officials also worked with municipal leaders, public safety and emergency managers within their communities. Municipal leaders were involved to varying degrees within communities and at least one issued a town wide policy reinforcing MDPH exclusion requirements. Some met with local public health leaders throughout the summer and well into the winter months. Others asked to be abreast of important information, but wanted to play a more minor role in the planning and implementation activities.

In smaller communities across the state, recognition of the limited resources available to adequately respond to a large communicable disease outbreak sparked creative strategic planning. In more rural regions, planning efforts focused regional approaches to targeted and mass vaccinations. One area partnered with a regional school district to coordinate vaccination efforts and a community health center to serve as a vaccine depot. Another region divided itself up into three sub-regions. Each region decided upon the regional approach that was most appropriate for their group of communities. In other regions, partnerships were formed with local hospitals who coordinated and implemented vaccine clinics.

Strategic planning occurred through face-to-face meetings and conference calls. The majority of participants described a series of initial in-person planning meetings with school-based, municipal, and other partners. Some continued to meet face-to-face for several months. Others established standing meetings conducted via conference calls. A handful of communities also described using the initial conference calls with the Massachusetts Department of Public Health as a point of departure for planning meetings throughout the late summer and into fall.

On a state level, MDPH representatives, including the MDPH Commissioner, attended LSAC meetings and responded to suggestions and concerns made by local health. At the request of local health representatives, the Commissioner wrote letters, developed videos and PSAs, and agreed to identify formulations on weekly reports to assist with clinic planning. Local health was also included on a H1N1 advisory committee meeting to get local health input.

By and large, strategic planning meetings focused on who was going to be targeted for vaccinations, strategies for vaccinating target populations, and training needs of personnel who are available to staff clinics. Many also had to focus at least some attention on the media, including developing a communications strategy and mitigating existing problems from sensational media reports in previous months. Finally, strategic planning meetings early on focused on developing an array of strategies for disseminating information to the public.

Activity 2.2: Develop/revise operational plans

The majority of communities looked to their Emergency Dispensing Site plans as a starting point for mass vaccination planning. Plans had to be adopted for targeted clinics in schools for school-aged children. Some were to be held during school hours while others after school and/or during weekends. College campuses planned for large on-campus flu clinics as well as vaccinations available at school health centers.

Several of the larger cities took a different approach to planning for mass vaccination of target populations. The Boston Public Health Commission, for example, looked at their City Readiness Initiative (CRI) plans, which utilizes community health centers throughout the city to serve as dispensing sites during public health emergencies. Coordinated plans were revised to work with community health centers, pharmacies, school health centers, and other primary care physicians and support vaccination of patient populations and the general public. In addition to supporting these efforts, BPHC planned to serve as a “gap filler” in neighborhoods where there was limited access to health services. Mass vaccination clinics were originally planned in these communities.

A few participants described strategies for reaching out to other target groups, such as pregnant women and persons with high risk medical conditions, early in the planning stages. Some did target these groups early on and utilized office appointments or worked collaboratively with area hospitals to provide targeted clinics. One of the reasons more local public health departments did not develop strategies for these high risk individuals early on may have been because the focus of guidance from the CDC was on children. A few participants also noted that they assumed during the planning stages that these other vulnerable populations would most likely be vaccinated by their healthcare providers.

Activity 2.3: Validate plans and repeat planning cycle as needed

By and large, participants in the focus groups reported feeling as though they were ready to put on the mass vaccination clinics for which they had planned during the summer and early fall. Many reported that previous planning they had done for pandemic flu paid off. Plans were in place as were many of the relationships with municipal leaders and emergency managers. Several communities modified the location of their clinic sites after visiting them with emergency managers. Others expanded their sites to include schools. New partners, such as school nurses, school administrators, and primary care physicians, were incorporated into existing plans with varying degrees of success.

The delay in vaccine distribution in the fall of 2009 required nearly all communities to modify their plans for mass vaccination. As required by MDPH, many had scheduled and advertised H1N1 clinics during late October and early November that had to be cancelled. The limited amount of vaccine that was available throughout most of November was inadequate to support large-scale vaccination plans. Most planning groups within communities had to reconvene and develop alternate vaccination plans. Some focused initially on small high risk groups, such as pregnant women or caretakers of infants. Others decided to store the small quantities of vaccine they received until enough was sent to the health department to hold clinics in schools. In smaller communities, several local public health officials revised plans by incrementally vaccinating

school-aged children: all kindergartners were vaccinated, followed by first graders, second graders, and so on.

Observations and Analysis

Planning for a large H1N1 outbreak was, without question, a time consuming, labor intensive process that consumed many public health nurses, directors, municipal, school, and healthcare leaders across the state. Widespread news coverage of deaths associated with H1N1 as well as the chaos of some early mass clinics in Texas and other southern states led many to fear the worst was yet to come. As one participant in a northeast coalition noted, “There was a lot of fear among us in our early meetings. I have it in my notes... we are not going to have the security, people are going to flood us. We saw the stuff on the news... we were all a little scared.”

Strategic planning focused on clinics, but also on prevention measures that could be put in place immediately to curb outbreaks until vaccine became available. Planning for clinics included estimating the numbers of people who would be vaccinated through the health department and placing the order with MDPH, refining site logistics, recruiting and training volunteers to staff vaccine clinics, and developing prevention strategies.

In August of 2009, MDPH asked all local public health departments that could receive vaccine to estimate the number of persons in the target groups that they may be able to vaccinate. Specific guidance on how to fill out the request was not provided. As a result, there was great variation in the interpretation of the guidelines that MDPH sent to local public health officials. Some communities simply requested vaccine for their entire population. Others requested vaccine for all school-aged children in their communities or district. Some made estimates based on their experience with previous seasonal flu clinics, with roughly one-third of the total population being the most common estimate of the amount of vaccine needed for public clinics. Participants in most coalitions believed that the initial request for vaccine was a “place holder” and modifications would be possible once additional information about the vaccine and the timeline was made available. By and large, most emergency preparedness coalitions did not report discussing and agreeing upon a single strategy for estimating the amount of vaccine to request. Ultimately, a mix of strategies was identified within each coalition, which ended up posing problems later when limited amounts of vaccine were finally available. Disparities in vaccine distribution throughout October and November created tensions within and between municipalities and with MDPH. There were also mixed messages on whether provider sites should be registered under the local health department or register independently and shifted as more sites were allowed by CDC. This caused confusion amongst providers and local health departments.

During the planning phase, communities also noted increasing challenges with Standing Order requirements that were needed to request vaccine. Frequent changes to the Orders provided a logistical complication with orders needing to be resigned with each change. Standing orders programs authorize nurses and pharmacists to administer vaccinations according to an institution- or physician-approved protocol without a physician's exam. These programs have documented improved vaccination rates among adults.² Some local boards of health or health departments do not have physicians in their communities or affiliated with the board of health to sign Standing Orders. The requirement led some communities to begin collaborative, cross-municipal planning. In such cases, one community would either agree to sign for vaccine for another community, or

² Centers for Disease Control and Prevention, Advisory Committee on Immunization Practices. (2000) Use of Standing Orders Programs to Increase Adult Vaccination Rates: Recommendations of the Advisory Committee on Immunization Practices. *MMWR*; 49(RR01);15-26

multiple communities agreed to work with a community health center or hospital to coordinate vaccination efforts.

Many communities had planned early on to work with schools to vaccinate one of the primary and perhaps largest target groups: school-aged children. As noted above, engagement of school administrators was met with varying degrees of success. Early support and buy-in from school superintendents was considered to be crucial to cooperative planning. School nurses, whom many thought would be natural allies in the effort, had mixed reactions to supporting clinics during school hours. Some were on-board immediately, especially those who are located within local public health departments. These nurses tended to have more experience with vaccinations as they often support seasonal flu clinics for their cities and towns. Others were more reluctant at first because many lacked experience with vaccinating people and were uncertain of how they would be perceived by children for whom they care on a daily basis. In nearly every coalition, there were some communities whose school nurses did not want to help with vaccinations because they didn't want to be the ones causing pain to the kids. Despite early reluctance, many school nurses and administrators eventually played an important role in the planning for and prevention of a major H1N1 outbreak. State- and locally-sponsored vaccination trainings were helpful to many school nurses who felt out-of-practice or fearful of vaccinating children. Some local public health officials decided that there were other roles that school nurses could play during vaccine clinics, such as screening, answering questions, and triage.

During the planning phases, many communities and regions also began planning for how to use local and regional Medical Reserve Corps volunteers to support clinics. Many communities and regions have active MRCs and planned early on to use them to support clinics. Several communities utilized their PHER funding to support a coordinator that could help outreach to registered MRC volunteers and recruit additional ones as needed. MRC coordinators, once hired, joined strategic planning efforts. Some spoke at length about the importance of PHER funds to reorganize the regional MRC group in that area and at least one unit hired a MRC coordinator early in the planning process who was responsible for recruiting and training MRC volunteers to work in their communities. As with the school nurses, MRC volunteers participated in local and state-sponsored trainings in preparation for vaccination clinics as needed and appropriate.

Prevention efforts were a major focus area among local and state public health officials, schools, healthcare providers and others during the summer and early fall months. MDPH adopted and generated a number of prevention materials that local health officials decided to use in their communities. These included "Cover Your Cough" campaign materials, "Caring for Someone With the Flu" guidance, and good hygiene educational materials. Hand sanitizer and dispensers were purchased for classrooms, cafeterias, municipal buildings, and other public venues. Many local health departments developed web sites which were linked to other town departments to provide the most updated information and resources. In the absence of a vaccine in hand, planning for prevention campaigns and resources was considered essential in efforts to mitigate the spread of H1N1.

Several communities also used the planning period to review school policies that may work against prevention efforts. Some school districts decided to suspend Perfect Attendance Awards out of concern that it would increase reluctance among students and parents to stay home if experiencing flu-like symptoms. Some also dropped a requirement for a doctor's note to return to school if a student had been out with flu-like symptoms. Instead, students reported to school nurses before returning to class. This allowed more personal interaction with children who had experienced illness and reduced burden on local healthcare providers. Without doubt, the delay in the production of vaccine challenged many local public health officials and forced many back to

the planning table. Repeatedly, public health officials reported that they had spent countless hours planning for mass vaccination clinics that never happened, or that eventually happened after the public demand for vaccine had begun to wane.

Recommendations

In many focus groups, participants noted relief that the incidence of infection was lower than expected. They had a real opportunity to test out some of their emergency plans, including prevention, mass vaccination, and communications, in a relatively calm environment. Strategic planning for H1N1 vaccination clinics and other prevention efforts were reported to be a real strength for many communities. The planning process brought together existing partners and helped to forge relationships with new partners. In smaller communities who decided to take a regional approach in their response, many had a chance to plan together with neighboring boards of health as well as regional schools and community health centers or hospitals. The following recommendations emerged from focus groups as important to consider when planning for public health events and emergencies.

1. Years of planning for health emergencies helped local public health officials be prepared for response to the many challenges that H1N1 posed. Many participants indicated that on-going drills and exercises are important for the maintenance of plans, partnerships and knowledge-base. Joint exercises with schools, healthcare providers, and others will help support on-going relationship building and understanding across disciplines.
2. Partnership building can happen during an emergency situation, but it is not ideal. Communities who had existing relationships with local schools, healthcare providers, community outreach organizations, and child care centers reported fewer difficulties during the planning stages with bringing people together and developing efficient and effective prevention and vaccination strategies.
3. Engaging high-level school and health administrators early on was essential in most communities.
4. Although many early plans did not play out, the process of bringing people together and dialoguing early on helped communities work together to face the challenges of delayed vaccine.
5. Engage local media early on so that you can stay ahead of the story
6. Local universities are valuable resources during emergencies. Public health nursing students, for example, can increase the capacity of local communities to operate public vaccination clinics
7. Providing an emergency order and training to an expanded group of vaccinators helped the vaccination effort and should be replicated in future public health emergencies requiring mass vaccination.
8. Assumptions cannot be made that all colleges and universities have the same capacity to care for their student bodies. Community colleges, for example, were often left out of local planning efforts. Partnership building with university and college leaders is identified as a need in many communities.
9. Coordination of human and material resources is very time consuming. Essential positions to fund during public health emergencies may include MRC volunteer coordinators and persons responsible for resource tracking and billing. Planning for these positions and clarifying roles and responsibilities early on is important.
10. The need for MDPH to receive local input during the planning stages either through focus groups, advisory councils, LSAC or CLPH is imperative.

Capability 3: Epidemiological and Surveillance Investigation

The Epidemiological Surveillance and Investigation capability is the capacity to rapidly conduct epidemiological investigations. It includes exposure and disease (both deliberate release and naturally occurring) detection, rapid implementation of active surveillance, maintenance of ongoing surveillance activities, epidemiological investigation, analysis, and communication with the public and providers about case definitions, disease risk and mitigation, and recommendation for the implementation of control measures.

There were two primary types of surveillance that local public health officials identified as being important for planning and response activities. The first is the tracking of influenza-like symptoms and/or confirmed cases of H1N1 within local communities. The second is the tracking of vaccination administered within a geographic area and/or by demographic characteristic.

Activity 3.1: Surveillance and detection

This activity entails the collection of health data to recognize events of public health significance and report them to appropriate response personnel. Approximately one-third of all communities who participated in our focus group discussions reported that they developed or coordinated with surveillance systems within schools to track reports of influenza-like symptoms among school-aged children. With school-aged children identified as a primary risk group, partnering with school nurses to perform surveillance activities was an important way to increase awareness of local outbreaks. In some communities where surveillance was performed and shared with local public health officials, school nurses took the lead in documentation and reporting of symptoms. In others, information was shared by administrative staff and tracked by the health department. Most entered cases and descriptions of symptoms into an excel spreadsheet and sent it to local public health directors or public health nurses on a daily or weekly basis. Several participants indicated that the daily reports they received during the spring of 2009 were helpful, but the data collection and reporting burden was too much. One local public health department created an on-line survey using SurveyMonkey. The on-line survey was an easy format for school nurses to use and the results were automatically sent to local public health officials with access to the site.

A smaller number of communities were able to participate in surveillance activities of the general public through partnerships with local hospitals and community health centers. In some of the communities relationships between health and public health officials had been previously developed through joint participation in exercises, drills, and other health events. Existing relationships and mutual understanding of the need for surveillance helped facilitate the sharing of information across disciplines. In some localities, for example, weekly meetings were set up between with the hospitals and health centers, public safety, EMS and a number of other stakeholders to share information about H1N1 and establish policies and procedures. Hospitals and health centers had designated time on each agenda to report out on chief complaints from the previous week. It was agreed upon during the planning phase that anomalies would immediately communicated via email to all partners. At least one community hired an epidemiologist to be responsible for collecting, tracking and reporting out on surveillance data from schools, providers, hospitals, daycare centers, emergency personnel and, to a limited degree, local businesses.

Activity 3.2: Monitor containment efforts

The monitoring of containment activities can involve a range of activities. The purpose is increase the capacity of responders to assess the effectiveness of measures being implemented to reduce or eliminate the transmission of H1N1. Participants in most focus group discussions identified the tracking of vaccination within communities as a key strategy for assessing who has been reached by primary prevention efforts. Very few communities, however, reported being able to effectively

perform this activity. Local public health officials were able to keep track of who they administered vaccine too, but most estimate that they reached only about a third of their population at best.

MDPH required local public health officials to document a minimal amount of information about persons they vaccinated. Age and dosage number were the two primary data elements. Local public health officials learned early on that this information alone was not enough to assess who within their communities had been vaccinated, and whether or not there were disparities by neighborhood, race/ethnicity, or other characteristic of interest. This led some to add information to be collected on persons vaccinated by local public health officials, including gender, race/ethnicity, zip code, and city or town of residence.

The Boston Public Health Commission utilized a vaccine tracking system that they had purchased with City Readiness Initiative. The system includes a scanner that can be used to extract key information on driver's licenses or state ID cards. The information is scanned into a database and can be pulled into any number of programs for analysis. Each community health center and public clinic where vaccine allocated to BPHC was distributed utilized the scanning system to keep track of demographic as well as dosage information.

Observations and Analysis

Communities who developed the support for and capacity to perform surveillance within their communities found the data to be useful for planning and evaluation purposes. Surveillance systems set up within public and to a lesser degree private schools were the most common. Information was used on an on-going basis to monitor upswings in flu-like symptoms. When upswings were noted, some local public health officials took the opportunity to push more information and prevention education out to parents through systems like Connect-ED and email listservs. They also used the surveillance data to assess changes in reported symptoms that may have occurred following vaccine clinics within schools. Several participants noted that the information they gathered through school surveillance was so useful that they anticipate continuing to request data throughout the next year.

A few participants also described the challenges they faced in trying to set up surveillance systems within schools. Some school officials were reluctant to allow information to be provided to local public health officials out of concern that it would be used to authorize school closures or might go against confidentiality requirements. Some were able to overcome these perceptions by successfully arguing the data would actually be helpful in keeping schools open by keeping close track of who was reporting flu-like symptoms so that they could be monitored and kept out of school until they were symptom free. Some vetted it through their legal counsel. Some were just not able to overcome the misperceptions of how surveillance data would be used and did not have this available during the year.

The key to setting up a successful surveillance system within local communities was to identify the right person to give you the data. In schools, the right people are often a nurse and an administrator. School nurses can keep track of students who develop symptoms while at school. Administrators are needed to track the reason for absenteeism among students who do not report to school. In hospitals and health centers, however, the right person may not be obvious. Having existing relationships with hospitals and community health centers helped local public health officials to quickly figure out who the right people were for requesting surveillance data. Without these relationships in place, many were unable to launch surveillance efforts in a timely manner.

With respect to the tracking of vaccine administration, nearly all local public health officials reported that it would have been very helpful to know which providers within their communities

received vaccine. The Boston Public Health Commission was the only local public health agency that reported being able to access this information from hospitals, but the data was limited and not able to be provided in real time.

Recommendations

1. Local surveillance systems to monitor flu-like (or other) symptoms are worth developing early in the planning phase of a public health event. Surveillance data can help identify increases in illness, inform the need for additional education and prevention messaging, and help direct resources for prevention and mitigation. Surveillance systems can also be used to assess the impact of prevention and mitigation efforts.
2. Establishing good working relationships with school officials, hospital and health center administrators, and healthcare providers is essential for the development and effective implementation of surveillance systems. All partners who gather and receive data need to have a mutual understanding of respective roles and responsibilities during emergencies.
3. Clarity around the use of surveillance data is needed during the planning phase of a public health event. Protocols and procedures for sharing and receiving information need to be in place in order to protect the confidentiality of constituents.
4. More coordination and detail of information from MDPH to the local level regarding resource requests is needed in order to be able to track vaccine administration and plan mitigation efforts within a given locale.
5. MDPH should take a leadership role in requiring the collection of data elements that can be used to assess the extent and reach of vaccine administration within communities. Although the data reporting requirements from MDPH were simple, the information in and of itself was not helpful for monitoring containment efforts. Several participants recommended that MDPH bring a group of local public health directors and nurse, healthcare, and emergency managers together to identify what data elements should be collected, how they should be collected, and reporting formats.

Capability 4: Emergency Public Information and Warning

The Emergency Public Information and Warning capability includes public information, alert/warning and notification. It involves developing, coordinating, and disseminating information to the public, coordinating officials, and incident management and responders across all jurisdictions and disciplines effectively under all hazard conditions. Government agencies and public and private sectors receive and transmit coordinated, prompt, useful, and reliable information regarding threats to their health, safety, and property, through clear, consistent information-delivery systems. This information is updated regularly and outlines protective measures that can be taken by individuals and their communities.

This capability entails the use of any number of strategies to communicate general, crisis and emergency risk information to the general public. Local public health officials played a lead role within their communities to disseminate educational materials, prevention information, local and state policies, and vaccine information to residents within their communities. A primary goal of this capability is the delivery of coordinated, consistent and prompt information to the public regarding threats to their health and safety, useful measures that can be taken to protect themselves, their families, and others within their communities.

Activity 4.1: Develop plans, procedures and systems for public communications

The planning for how to communicate relevant information about H1N1 to the general public began in most communities during the spring of 2009. Throughout the summer, the planning groups described above in Capability 2 included public information and dissemination strategies.

Many local communities decided early on to adopt the educational materials that were developed by the CDC and MDPH for the general public. The communications campaign launched by MDPH and adopted by local communities focused on the following areas: Vaccination – encourage people to get a seasonal flu shot, and an H1N1 flu shot, especially if they are considered high-risk; Prevention – increase behaviors that prevent the spread of flu such as hand washing and covering your cough/sneeze; and Mitigation – encourage people to stay home when sick and to keep their kids home when sick. These three areas provided an organizing framework for messages to the public.

The strategies developed to disseminate public information varied by community, but often included a combination of active and passive strategies. Active communication strategies included disseminating information through school communication systems (e.g., Connect-ED, flyers sent home in backpacks), recorded messages sent out through municipal reverse 911 telephone systems, and community forums. Passive strategies included posting information on municipal and school websites, and posting flyers and campaign materials in public spaces. During the planning phase, participants also discussed the need to accompany prevention messages with appropriate resources. For example, posters about hand hygiene were next to hand sanitizer dispensers in public sites.

A smaller number of communities hosted community forums that provided residents with an opportunity to learn more about H1N1 and measures they could take to prevent or mitigate infection. Some of these forums were targeted, and included presentations to school-aged parents hosted by the PTA or to business leaders through the Kiwanis Club.

Few communities reported having a central system in place to review, approve and disseminate information to the public. In some communities, school officials shared drafts of materials with local public health leaders to ensure accuracy and consistency of information. These efforts were performed on an ad hoc basis. Although not specifically stated by a majority of participants, we

also assume that most municipalities involved their public information officer in the review and dissemination of information through official channels, such as news outlets, and municipal websites.

Activity 4.2: Issue public information, alerts/warnings, and notifications

With the absence of vaccine throughout much of the early fall, local public health officials and partners dedicated a large amount of time to public education and prevention measures. Most municipalities pushed information out to the public using the strategies they identified during the planning phase. Parents of school-aged children were reached through Connect-ED communication systems, flyers in backpacks, and school forums. School-aged children watched “Cover Your Cough” educational videos, participated in hand washing demonstrations put on by school nurses, and viewed educational materials posted in bathrooms, cafeterias, and other public places throughout the school. Pregnant women and persons with compromised immune systems were provided with information from their healthcare providers. Councils on Aging were used to contact senior citizens. “Mommy listservs” were used to give out information to parents and other potentially at-risk populations were contacted through religious organizations, local gathering spots, WIC offices and non-profit community and advocacy groups. The general public received information from local, state and national news sources, public education campaigns, Reverse 911 systems, public websites, and community forums. Some communities also utilized new social marketing venues such as Twitter and Facebook to keep their residents informed.

Few communities had the resources to develop their own campaign materials and strategies. The Boston Public Health Commission is one of a few exceptions. With a Communications Department at the Commission, local emergency managers decided early on that persons in this department would be responsible for developing an overarching public information plan. They developed a four phase plan that initially included a “Cover Your Cough” campaign with information posted around public sites regarding cough and hand hygiene etiquette. The second phase was a vaccination campaign (“Got a pulse? Get Vaccinated”), with billboards posted on buses, trains, city offices, and other public venues. The third phase entailed targeted regional leafleting in neighborhoods where reports of flu-like symptoms were high. Flu information and prevention education materials were included in water bills and posted in popular neighborhood venues. Finally, a series of independent community presentations were held throughout the city to directly communicate information about H1N1 to the public and provide an opportunity to raise questions and concerns. Most municipalities did not have the resources or capacity to develop and implement a coordinated communications strategy, but many did include some of these elements in their own work.

Activity 4.3: Conduct media relations

A small number of participants described proactive strategies for engaging local media to support and facilitate public information alerts, notifications and education. Some communities noted an explicit outreach to local newspapers during the planning phase. Others reported having some existing relationship with local newspapers to advertise seasonal flu clinics. Communities with local cable channels also used these outlets to air the “Cover Your Cough” video, issue public service announcements about vaccine, prevention and mitigation measures, and communicate other related information to the public. Few mentioned the use of radio to deliver public service announcements. However, some local and state health commissioners and communicable disease directors in larger cities had several interviews aired over the radio.

Observations and Analysis

Most participants reported using a variety of strategies identified during the planning phase to communicate with target groups and the general public. The use of existing technologies, such as

Connect-Ed in schools, provided the capability of sending automated messages to parents and caretakers of all children within a school. Some towns also had Reverse 911 systems and community email listservs that allowed for a large number of residents to be quickly and easily reached with targeted messages. Some communities established a web site for H1N1 which was connected to CDC/WHO sites and linked to all town departments to ensure current and consistent information was being provided. Some also provided regular meetings with school administration, public safety partners and health providers to keep them informed. Local newspapers and other media outlets were used to advertise prevention and vaccination resources as well as disseminate longer articles about how to protect yourself and loved ones from the flu. Finally, public presentations incorporated into existing forums were identified as a cost-effective and efficient way of getting information out to the public. For example, one local health director asked for 15 minutes on the agenda of a high school sports meeting with parents to talk about H1N1. Others utilized PTA meetings and community clubs to talk with the public.

Several towns learned that the systems they had developed for rapid emergency communications with the public were antiquated or not efficient. Having the opportunity to test technology-based systems during a non-urgent public health crisis was recognized as a benefit for local emergency planners. The availability of funding supported the updating of some systems and helped improve protocols and procedures for information sharing.

One of the biggest public communications challenges that local public health officials had to deal with was the delay in vaccine production and distribution. At the federal and state levels, widespread advertisement of the estimated date that vaccine would be available to the general public was, in retrospect, a mistake that deserves attention. Production of any new vaccine can run into unforeseen obstacles. The provision of an exact date followed by a limited distribution capacity led to many phone calls from residents and countless hours explaining why local public health officials had not yet received H1N1 vaccine.

Local public health officials had a more challenging time reaching special populations within their communities to provide information about H1N1. Immigrants, persons with disabilities, and homeless persons are just a few examples of groups that are hard to reach using general communication strategies. Several participants explicitly described strategies they used to reach the special populations in their communities. Some worked through community outreach workers and nurses who provide services to specific populations to disseminate information. Other reached out to local churches that attract immigrant populations. Finally, publication of information in population-specific newspapers and posting of flyers in ethnic stores bakeries was also done in some communities with some measure of success.

Strategies to manage public information and warnings were largely reactive in most communities. Inconsistent guidance and information from state-level agencies led to challenges early on in the response phase. Questions about vaccine safety, inconsistencies in the lowest threshold for flu symptoms (i.e., temperature of 100 vs. 100.3), and continually changing dates for vaccine distribution resulted in an increase in phone calls to local public health agencies, and disagreements among key personnel about appropriate guidance and mitigation strategies. Information overload was also a challenge, especially in schools where local public health and educational partners attempted to channel information to school children and parents. In some cases, these efforts were not coordinated, posing concerns with the consistency of messages going out to target populations.

In addition to general vaccination, prevention and mitigation messages, many local public health officials reported spending a surprising amount of time explaining the rationale for priority risk

groups to constituents and health care providers. This was particularly true for seniors, who are typically a priority target group for seasonal flu vaccinations. A few participants described taking a proactive approach to reaching out to seniors to explain why they were not a priority group for this particular vaccine. Talks given at senior centers and nursing homes, as well as personal communications during seasonal flu vaccine clinics proved to be effective in reducing concerned or angry phone calls from seniors. Others who did not talk with the seniors in their communities reported spending a great amount of time throughout the fall explaining this information on a one-to-one basis.

Another proactive strategy that a few communities reported taking to “stay ahead” of information disseminated to the public was the engagement of local media during the planning phase. Some communities worked very closely with reporters from the local newspaper to get information out to the public. As advised by a municipal PIO, local health directors in these communities prepared the information they wanted printed and provided stories to reporters. This was essential for ensuring that information was reported accurately and in a manner that was conducive to vaccination, prevention and mitigation efforts. Local newspapers and radio stations were also good sources for publicizing the dates, times and registration procedures (if appropriate) for local vaccination clinics.

Recommendations

Generally speaking, communication with the public was viewed as a real strength in the response to H1N1 in local communities.

1. Many communities have a variety of resources that are available to support public communications. Utilization of large communication systems, such as Connect-ED and Reverse 911 proved to be effective and efficient strategies for communicating certain types of information, such as clinic dates, reminders, and referral to prevention resources.
2. Early engagement of providers or persons connected to high risk populations was a good way to reach target populations. Existing distribution lists, such as those for licensed daycare providers and nurses, can be useful tools for communication.
3. Work closely with municipal and institutional Public Information Officers when possible. Connecting with Public Information Officers from hospitals universities can be an effective way of disseminating information out to the public.
4. Proactive engagement of local media sources is a good way of communicating information to the public and “staying ahead” of alarmist or spectacular news stories. When working with local newspapers, several local public health officials recommended preparing stories that you want published rather than having a reporter develop them. This way you ensure the accuracy of information and maintain some control over what is communicated.
5. Identify human resources within each community that have a history of working with specific populations that may not be reached through general communication strategies. Outreach workers, nurses, community service providers, clergy, and some business owners can be useful resources for getting information out to traditionally hard-to-reach populations.
6. Many local public health officials would like for MDPH to play a stronger role in controlling local and state media sources. Active rebuttal of inaccurate information, such as the questionable safety of H1N1 vaccine, at the state level would be a more efficient way of reducing some public concerns than each community dealing with it on their own.
7. Work closely with the Massachusetts Medical Association to ensure medical providers are giving accurate and CDC/MDPH sanctioned information to their patients to prevent misinformation.

Capability 5: Risk Management

Risk Management is defined by the Government Accountability Office (GAO) as “A continuous process of managing—through a series of mitigating actions that permeate an entity’s activities—the likelihood of an adverse event and its negative impact.” Risk Management is founded in the capacity for all levels of government to identify and measure risk prior to an event, based on credible threats/hazards, vulnerabilities, and consequences, and to manage the exposure to that risk through the prioritization and implementation of risk-reduction strategies.

Activity 5.1: Develop a risk framework/Assess risks/Prioritize risks

The responsibility for managing risk in relation to H1N1 was spread across multiple levels of government, with the majority of risk identification and assessment, including the assignment of target groups for vaccination, happening at federal and state levels. On a local level, public health officials incorporated discussions of risk into their overall planning efforts (see Capability 2: Planning), but were more focused on implementing locally-appropriate solutions based on national and state guidelines.

Activity 5.2: Manage risk

Risk management for H1N1 required a paradigm shift from normal vaccination or seasonal flu efforts. The priority vaccination population targeted young people not used to thinking of themselves as “at-risk.”

Emergency dispensing sites designed for quickly distributing antibiotics in the event of a biological attack were not set up with appropriate cold storage for vaccines. Before the emergence of H1N1, fears of H5N1 encouraged health officials to update their emergency plans to account for pandemic flu, but plans were often incomplete or out of date, and many plans revolved around large-scale vaccination, which the delay in vaccine production hindered.

Mitigating the negative effects of the delay in vaccine production and distribution was a major focus of local public health. These mitigation efforts included identifying local priority vaccination and at-risk populations, implementing CDC and state instructions on prioritizing vaccinations (see Capability 8: Mass Prophylaxis) and intensive public education and prevention campaigns. Hand sanitizer dispensers were installed in schools, libraries, restrooms and other public places as part of the “Cover Your Cough” campaign and the public widely adopted their use. Local health officials worked with local churches to suspend practices which would promote exposures such as signs of piece and drinking wine from chalices. Over the course of the outbreak as resources and public demands fluctuated, local public health officials adapted their strategies but were frequently frustrated by circumstances beyond their control.

Activity 5.3: Conduct risk communication

Local efforts to target communications to priority groups and at-risk populations were diverse and creative, making use of many previously unconsidered communication networks. Students were encouraged to get vaccinated by sending emails to their parents. Populations with limited English skills were reached out to with messages translated into multiple languages, but some health departments with sizeable immigrant populations found accurate translations to be difficult. At the same time as public health was attempting to reach out to priority groups, they were also required to explain to lower-risk populations who were not targeted for vaccination why they would not have access to initial shipments. However, after not being involved in choosing priority groups and often lacking a professional background in epidemiology, some local public health officials without public health nurses on staff, struggled with explaining the logic of the prioritization to the public.

Officials were also fighting a public relations battle against skeptical healthcare providers and

other individuals concerned about the safety of the vaccine. In this situation, messages to the public from the CDC and MDPH were more harmful than helpful. Attempts to reassure the public of the “new” H1N1 vaccine’s safety by publicizing efficacy studies had the opposite effect. The choice by the state to offer a thimerosal-free vaccine option only reinforced the idea that thimerosal was potentially dangerous and something to be avoided. Local public health officials took action by partnering with allergists and creating decision charts to post at clinics to guide people in choosing between nasal and injectable vaccines, but they recognized the futility of attempting to counteract the public opinion questioning vaccine safety on a case-by-case basis.

Observations and Analysis

Although many local public health officials felt able to handle large-scale vaccinations, this confidence was not put to the test, as supply problems led to a focus on prevention instead. Public health officials used the wait time for vaccine to conduct intensive risk communication and public education on priority groups and prevention, and expanded their outreach efforts to new groups. These prevention efforts are a point of pride with many local public health officials who can see evidence of real, ongoing behavior changes in hand washing, hand sanitizer use, and cough etiquette, but the success of such efforts occurred in a context of overcoming unnecessary challenges which could have been avoided or minimized with a stronger network of communication between local public health, MDPH and healthcare providers.

Primary care physicians would have been an excellent ally in combating fears over vaccine safety, but proved to be problematic in many parts of Massachusetts. Many healthcare providers were not convinced the necessity of the vaccine or not willing to give vaccinations to their patients. A large number of practitioners were providing their patients with different, sometimes contradictory information than what public health officials were disseminating. There was also disagreement between public health and healthcare providers over who had the responsibility to vaccinate certain populations, like pre-school aged children. The lack of consistent communication on risk and safety between public health and providers, as well as the lack of consistency both groups were giving to the public, is a noted area for improvement.

The disconnection between messages from MDPH and media coverage with the experience of local public health, left many local officials feeling abandoned by MDPH. Without the information necessary to adapt MDPH guidelines to local contexts and confused over which guidelines they had the authority to adapt, local public health officials were unable to manage the risk of H1N1 in either the most locally-appropriate or cross-jurisdictionally uniform manner.

Recommendations

1. MDPH and the CDC must increase their communication with local public health on the rationale behind risk assessments and vaccine prioritization and remain consistent with their messages. They must be willing to back up local health when challenged by the public.
2. At the state level, and preferably in cooperation with nearby states, a central authority must be identified as having the responsibility to mandate target populations for vaccination and ensure cross-jurisdictional uniformity. By centralizing responsibility for risk assessment and management, officials with the information necessary to make decisions will also have the authority to act on that information.
3. Identify resources and procedures for translating risk communication materials into other languages. MDPH and the CDC are good places to start, although some translations were not appropriate for certain dialects. Community outreach workers and hospital translation services are good resources.
4. At the local, state and national level, communication networks between public health and

healthcare providers must be developed to ensure consistent communication to the public and allow for procedures to be established that describe the role of providers in public health emergency scenarios, including responsibilities for vaccination and surveillance.

5. Proactive rebuttal from MDPH regarding safety concerns for vaccine would increase efficiency in allaying public concerns and reduce individual burden on every local public health official to challenge misperceptions. Large scale public service announcements from trusted leaders delivered in a timely fashion are recommended and should continue.
6. Strong partnerships are needed to reach the diverse populations that are living in the Commonwealth. Coordination and planning with state and local leaders, such as the Massachusetts Medical Association and clergy are critical to the effort to outreach and education efforts.

Capacity 6: First Responder Safety and Health

Responder Safety and Health is the capability that ensures adequate trained and equipped personnel and resources are available at the time of an incident to protect the safety and health of on scene first responders, hospital/medical facility personnel (first receivers), and skilled support personnel through the creation and maintenance of an effective safety and health program. The Responder Safety and Health capability is a critical component of safe overall emergency management. First responders include police, fire, emergency medical services (EMS), and other emergency personnel, as well as emergency management, public health, clinical care, public works, and other skilled support personnel (such as equipment operators).

Activity 6.1: Develop and maintain plans, procedures, programs and systems

Although preexisting plans and procedures were cited as a major strength in planning the response to H1N1, the plans and procedures for ensuring the safety and health of first responders and volunteer MRC members, were an issue for local public health officials. Standard emergency plans call for first responders to be among the first groups to be vaccinated, but as state and federal officials revised these standards to cope with the shortage of vaccine, conflict emerged between the expectations of local first responders (and many local public health officials) and the guidelines disseminated by MDPH and the CDC.

Activity 6.2: Direct responder safety and health tactical operations

In most emergency plans, first responders have priority for protective equipment and prophylaxis. Due to vaccine shortage during the initial phase of production, the priority group for H1N1 vaccination was subdivided into two tiers. Public health and safety were not included in the top tier, but this was not clearly and consistently communicated to local public safety officers from the Department of Emergency Operations and Public Safety, and led to confrontations between many local public safety and public health officials. MDPH also indicated early in the fall that each EMS council was going to receive a certain allocation of vaccine. As a result, many local health departments did not feel the need to utilize the initially short supply of vaccine for their community EMS personnel. However, receipt of the vaccine from their council was inconsistent.

Public health officials in charge of vaccination dealt with this issue in multiple ways. In some communities, health officials tracked and distributed personal protective equipment (PPE) supplies available for first responders, to ensure PPE was in adequate supply for their community. Most met with representatives from police and fire departments to explain the shortage and discuss options, but most of these meetings ended in frustration. Some towns, particularly in areas where the officials in charge of vaccination were closely linked to first responders, added first responders to their priority vaccination groups. Others emphasized prevention for first responders and created personal protection equipment kits that included masks, sanitizers and other tools. Although each strategy was locally appropriate, the variation in approaches known to exist across the state created additional friction between public health and public safety.

For MRC volunteers, many local health departments felt the need to offer the vaccine to those members who were vaccinating and providing the clinic support needed. This also provided a mechanism to entice members to participate and get their vaccination because they were volunteering.

6.3: Activity: Site/Incident specific safety and health training

Site/Incident specific training for first responders focused primarily on crowd control and management of the public as persons move through a clinic. By the time most clinics large enough to warrant the presence of public safety officers, there was enough vaccine to administer to local first responders. Transmission prevention measures were not a major focus. Public

safety officers and local public health officials did spend time discussing possible scenarios at large clinics and strategies for ensuring a calm public presence. Many public safety officers had experience with supporting seasonal flu clinics and were familiar with their general operation. Some participants explicitly noted that public safety officers participated in Just in Time trainings for volunteers so they would gain a better understanding of the clinic organization and operation.

Observations and Analysis

The conflict between local expectations that first responders would be a priority for vaccinations and the guidelines for vaccination given to public health officials was a challenge for the working relationship between public safety and public health. Most local public health officials reported following the guidance and waiting for the OK from the State to expand vaccination efforts before administering to first responders. However, not all did. Tensions remain in some communities, particularly in those who abut neighboring communities where first responders did receive vaccine during the first wave of distribution. Inconsistencies across communities in adhering to CDC and MDPH vaccine guidance also created tensions among local public health officials. Some public health officials believe the conflict has negatively impacted their relationships with public safety officials and will need to be addressed.

A related challenge to the issue of vaccinating first responders was who fit under the umbrella of “first responder.” The definition of first responder was deliberately left ambiguous by the CDC and final authority was at a local level, but many local officials were unaware of this, and other officials, aiming for consistency, closely followed the guidelines, which led to numerous different combinations of firefighters, EMS, MRC members and police officers being treated as first responders.

In spite of these challenges, the working relationship between public health and public safety officials at most H1N1 clinics was reportedly very good. Emergency medical technicians (EMTs) and paramedics were found to be an excellent, previously untapped, resource for vaccinations and the majority of EMT vaccinators were more comfortable giving pediatric vaccinations. Unlike in other parts of the country, police officers on crowd control duty were not an acute necessity, but they were a reassuring presence for clinic staff and organizers plan to continue to request their presence at clinic sites. Public health officials who acted to maintain a sense of camaraderie with public safety by supplying protective kits and enlisting the support of EMT in vaccinations were most successful in avoiding an adversarial relationship.

Some board of health members want updates to the state definition of “first responder” to include themselves. Many local board of health members are volunteers and are required to take time from their paying jobs to respond to certain types of incidents. Without inclusion in the state’s definition of a first responder, these volunteers can be penalized by their employers for meeting the requirements of their role as a board of health member. Additionally, teachers in some areas felt that, given that children were a priority group, teachers should be considered first responders because they were likely to come in contact with H1N1. Some volunteers and MRC members who immunized at clinics also felt they should receive priority vaccination. Looking to the future, the exact place of first responders in the vaccination hierarchy as well as the precise definition of a first responder will need to be addressed.

Recommendations

Local public health officials did not spend too much time during our discussions on first responders within their communities and how they were prepared for H1N1 response. Several recommendations were identified, but there are likely many more that we did not hear of.

1. A clear definition of “first responder,” including situation- or incident-specific first

responders, is needed. The local interpretation of “first responder” can lead to vast differences in who is targeted for training, protection, and prevention measures across communities.

2. MDPH can play a leadership role in ensuring that other state agencies, including public safety, understand the rationale for first responder vaccination priorities. Widely publicize criteria for prioritization as appropriate.
3. Coordinate communication between public health, education and public safety at the state level to ensure local officials in all three areas are hearing a consistent message.
4. Emergency preparedness coalitions may take a more proactive approach to limiting controversies surrounding the vaccination and prevention measures directed towards public safety officials. Inconsistencies in following the guidance for priority groups pose challenges across communities. Coalitions may agree ahead of time to follow the same protocols and procedures to facilitate mutual collaboration across disciplines and municipalities.
5. In the absence of being able to offer vaccine to first responders, “safety kits” and other prevention resources were appreciated and used.
6. Utilize a process for tracking PPE supplies available within the community. This may require a more coordinated effort with first responders, especially if supply shortages are forecasted.
7. Immunizing MRC members, who provided surge capacity for local health in vaccination efforts, should be considered, as they were needed to ensure an adequate workforce in the local health immunization efforts.

Capability 7: Isolation and Quarantine

Isolation and Quarantine is the capability to protect the health of the population through the use of isolation and/or quarantine measures in order to contain the spread of disease. Isolation of ill individuals may occur in homes, hospitals, designated health care facilities, or alternate facilities. Quarantine refers to the separation and restriction of movement of persons who, while not yet ill, have been exposed to an infectious agent and may become infectious. Successful implementation will require that sufficient legal, logistical, and informational support exists to maintain these measures. Most experts feel that isolation and quarantine will not stop the outbreak and that if used, the focus will be on cases that might introduce the disease into the State or other geographic area.

Activity 7.1: Implement voluntary isolation and quarantine

Isolation and quarantine measures played only a limited role in efforts to manage H1N1 in Massachusetts. Mandatory measures were not required, so efforts to isolate infectious and potentially infectious individuals were mostly voluntary. Messages promoting voluntary isolation and quarantine were sent out by local public health officials as part of risk communication efforts, including instructions on how to care for people with the flu at home (See Capability 3: Emergency Public Information and Warning).

The inclusion of children in the at-risk populations led to increased emphasis on isolation through schools and colleges, and many school districts instituted policies to help limit exposure at school. Some districts required students to check their temperature with the school nurse upon returning to school. Others required a note from a doctor verifying the child's recovery before being allowed to return to the classroom. However, in some areas this policy was overwhelming emergency rooms with requests for doctor's notes and the practice was suspended. Instead, instructions were sent home to parents to keep sick children out of school until five days had elapsed without a fever.

At colleges with large populations of students living in dormitory-style residences, self-isolation was encouraged. One college, while lacking the spare housing to institute an isolation unit like a nearby college, was able to encourage sick students to isolate themselves in their own dorm rooms by providing students with detailed information and instructions on dealing with cold and flu symptoms. A "flu buddy" system was established to bring food to isolated students instead of requiring potentially infectious students to mingle with the general school population in cafeterias, classes, and the health center.

The business community's response to voluntary isolation was mixed. Working with local health, large corporations offered emergency kits and telecommuting options to their employees and many local public health officials were impressed with the speed at which these corporations were sending updates to their employees. Often larger businesses actively sought out public health support and information. Several local health departments outreached to smaller businesses and were able to conduct information sessions and supply educational materials for posting in offices.

Observations and Analysis:

A key aspect of voluntary isolation efforts was the review of policies to ensure individuals who wished to isolate themselves had the ability to do so and to avoid perverse incentives which unintentionally encouraged people to risk spreading the infection. At least one community reported success in establishing a town wide policy with local government which encouraged adherence to state policy on exclusion and utilizing telecommuting when necessary. Some school districts discontinued issuing perfect attendance awards in the school system, while housing and healthcare workers at several colleges worked together to ensure students who wished to isolate

themselves were able to do so while maintaining access to food services and without being penalized academically for missing classes or exams.

Reevaluating attendance policies in preparation for widespread absenteeism is relatively simple and should be encouraged at workplaces as well as schools. Small businesses, lacking both the resources and extensive emergency plans of larger organizations, were unprepared for the strain on staffing caused by the pandemic, which put stress on potentially-ill workers and the working parents of sick children to ignore isolation guidance. A symptom of this lack of preparation, and a widespread challenge for schools attempting to limit the spread of H1N1 in classrooms, were cases of “drug and drops,” where parents would medicate sick children to mask their symptoms before dropping them at school and heading to work. Many of these children would be sent home within hours due to fever or other symptoms, but not before potentially passing the virus on to classmates and school staff. These cases represent an unnecessary risk to public health that could be mitigated with a review of company policies on parental sick leave.

During H1N1, local business communities and Chambers of Commerce were especially sensitive to the tension between limiting the spread of the disease in communities and keeping local businesses open, but in addition to the business community, local public health officials perceived an overall lack of support among their partners for event cancellation or other, more intrusive efforts to curb public transmission of H1N1. Although summer camp organizers were receptive to working with local public health officials they were not prepared to confront the possibility of closing their camps. While some school leaders in Massachusetts were concerned about national events like Take Your Child to Work day and National Education Week, they were reluctant to cancel such activities when schools across the nation were still participating.

Although isolation and quarantine efforts were played a minor role in the response to H1N1, the containment issues faced by local public health officials indicate several areas for improvement which would be helpful in preparing for a variety of potential emergency situations.

Recommendations

1. Local public health officials should outreach to businesses in their jurisdictions and establish relationships with human resources managers and small business owners. In addition to creating a new channel for the dissemination of information and educational materials, establishing such relationships may allow public health to play a role in helping to develop COOP plans to include sick leave policies to prepare for pandemics, clauses for telecommuting and parental sick leave policies when appropriate.
2. At the local and regional level, establishing a network of communication between schools, public health and healthcare centers would allow schools to disseminate sick policies and increase public health surveillance capabilities.
3. Public health officials at all levels of government need to increase support for voluntary isolation and quarantine measures at schools, colleges and governmental and business workplaces in advance of a future pandemic. Educating key personnel on the benefits of isolation and quarantine measures and presenting options such as telecommunicating, for implementation will prevent argument during an emergency situation.
4. Assessing and suspending practices that provide “perverse incentives” to not stay home when sick or when a loved one is sick is important. Education regarding why certain practices may not be the best for public health may be needed to gain support for suspended practices.
5. Having DPH develop an exclusion policy is imperative to the local effort in enforcing isolation and quarantine requirements

Capacity 8: Mass Prophylaxis

Mass Prophylaxis is the capability to protect the health of the population through the administration of critical interventions in response to a public health emergency in order to prevent the development of disease among those who are exposed or are potentially exposed to public health threats. This capability includes the ability to implement drug prophylaxis and vaccination strategies in a timely manner upon the onset of an event to prevent the development of disease in exposed individuals. It also includes the provision of appropriate follow-up and monitoring of adverse events, as well as risk communication messages to address the concerns of the public.

As noted in the planning section (Capacity 2), local public health officials spent a large percentage of their time during the summer and early fall months planning for mass prophylaxis clinics in their communities or regions. The majority of communities planned for clinics at the municipal level. Smaller communities, especially those in the western part of the state, decided early on that they would plan for regional clinics. Regional school districts presented opportunities to bring multiple communities together for collaborative work in some regions, and posed challenges in others. With a delay in vaccine production and distribution, most communities held fewer large public clinics than originally planned. As a result, some simply vaccinated fewer residents; others developed alternative strategies for vaccinating residents. By May of 2010, local public health was responsible for vaccinating just over a half a million residents across the Commonwealth.

Focus group participants identified a number of different types of clinics that they developed in order to reach target populations and the general public. These included: school-based clinics for elementary, middle and high school students, appointment based clinics for high risk populations (e.g., pregnant women, caregivers of infants), large public clinics in central community or regional locations, and clinics in non-traditional sites, such as malls, train stations, voting centers, and daycare centers. Most participants reported active coordination and participation in multiple types of clinics.

A number of activities were associated with the preparation for and implementation of mass prophylaxis efforts. They include, but are not limited to: recruitment and training of key personnel, establishment or refinement of clinic operations, and dispensing of vaccinations. These activities are explained in greater detail below.

Activity 8.1: Recruitment and training of key personnel

Recruiting volunteers to staff H1N1 clinics varied across communities and regions. In larger communities with public health nurses, school nurses and active Medical Reserve Corp volunteers, the identification of persons who could staff clinics and administer vaccine was not a major challenge. In smaller communities, the availability of human resources was varied. The availability of funding to build local capacity to staff clinics was helpful. One coalition, for example, utilized PHER funding to hire a MRC coordinator whose sole job during the planning phase was to identify, recruit and train medically trained volunteers. This turned out to be a tremendous resource for local communities and a sustainable capacity in the future. Many small communities also have experience contracting with local Visiting Nurse Associations and were able to expand the amount of human resources that they could purchase from these organizations.

All volunteer and paid staff had to be trained to administer vaccine. Many school nurses and MRC volunteers did not have experience with administering vaccines, especially in large scale clinics. A variety of training opportunities were created to support the expansion of persons able to administer vaccine. MDPH offered a series of trainings as well as training materials that were free to volunteers and other potential vaccinators. The School Health Institute also offered trainings to school nurses. Trainings for staff also took place at the local and regional levels.

Some public health nurses held special trainings for school nurses where they had a chance to practice vaccinating each other.

On the day of clinics, participants also described providing Just In Time trainings for clinic staff. The purpose of these trainings was to ensure a consistent level of knowledge about H1N1 and the vaccine, develop capacity to conduct appropriate screening and triage, and to familiarize vaccine administrators with the equipment available and protocols to administer vaccines.

Activity 8.2: Direct mass prophylaxis tactical operations

A key responsibility in the organization of clinics is to ensure adequate supplies of vaccine, ancillary supplies to administer it, and resources to dispose of equipment safely. The federal government purchased vaccine and supplies for every state and tribal unit in the country. State Departments of Public Health were responsible for distributing supplies appropriately. Vaccine was delivered via express mail to designated vaccine depots within municipalities and regions. Supplies, such as needles, sharps containers, gloves, band-aids, cotton balls, and alcohol wipes were delivered directly to requesting local public health offices or alternative designated facilities.

Once received, local public health officials were required to keep track of the vaccine administered to the public. At a minimum, this included tracking vaccine administered by lot number. There were a variety of vaccine types that were delivered to local public health, each with their own guidance and risk factors. Systems were also needed to keep track of which vaccine type individuals received, with assurances built in to the screening process that persons were receiving vaccine appropriate for their age and health condition. Some used a color coded system to differentiate vaccine types. Others designated certain vaccinators to administer each type of vaccine and utilized the screening process to direct persons appropriately.

While waiting for vaccine and associated supplies, the majority of local public health officials turned to their EDS plans as a starting place for organizing tactical operations for clinics. In large public clinics, the Incident Command Structure was used to coordinate human resources and make decisions in a timely and efficient manner.

School-based clinics, particularly those offered during school hours, posed new challenges for local public health. The requirement for signed informed consent forms from parents/guardians created a need for advanced preparation, organization and resources. MDPH first had to draft and approve an informed consent form for use at the local level. Once received, some school districts, administrators, teachers and nurses played a significant role in getting informed consent forms to parents/guardians and receiving and organizing signed forms. In other communities, the distribution process was organized by the local public health with forms being returned directly to the health department. In elementary and middle schools, informed consent forms often went home in backpacks. In high schools, consent forms were mailed to parents. Vaccination clinics that occurred after school and on weekends with parents present did not pose the same challenges as a parent/guardian was able to provide informed consent in person.

Large clinics were organized differently than small ones. Given that the majority of clinics had to be held during the winter months, a major concern was with long lines outdoors. Some resolved this concern by creating a clinic flow that quickly got people in the door, provided with appropriate forms, and then placed in designated areas for screening before vaccinated. A number of communities changed their clinic design all together by moving to an appointment-based scheduling system. Some purchased existing software to facilitate appointment scheduling. Others contracted with a software developer to create a system that would meet their specific needs. The system allowed them to obtain contact information and perform rudimentary screening

to plan for and facilitate movement through the clinic. Regardless of the type of system, most offered residents an opportunity to sign up for a vaccine appointment on-line for themselves and others in their family.

Advertisement of targeted and public clinics is also included as a responsibility under this activity. Strategies for advertising clinics to the public are described in greater detail in the section on Emergency Public Information and Warning (Capacity 4). Briefly, strategies included the use of mass communication systems, such as Connect-ED and Reverse 911, advertisement in local newspapers and cable TV shows, web pages, flyers posted in popular community venues, and mailings.

Activity 8.3: Activate points of dispensing

During the planning phase, MDPH pushed local public health officials to set dates for all mass vaccination clinics and post them on MDPH and local websites. Many set dates for mid-October when vaccine was anticipated to be delivered. The delay in vaccine distribution led many to have to cancel early clinic dates. This entailed not only communicating the cancellations to target groups and/or the public, but also to volunteers who had been organized to staff clinics. Once vaccine started reaching local public health, it came in such small amounts that it was impossible to implement original plans. The manner in which vaccine was initially distributed required local public health officials to continually assess the resources available to offer vaccine for several weeks. Once enough vaccine was available to reach a target population, volunteers were contacted and dates were set. Most clinics that were scheduled in the early and late winter were able to be carried out as planned. However some of the later clinics were eventually cancelled due to a lack of demand for vaccine.

As noted above, Just In Time trainings were provided to volunteers before most mass prophylaxis clinics. These trainings provided an opportunity to review the incident command structure, provide an overview of clinic flow, ensure that appropriate volunteers had an adequate knowledge of vaccine risks and types, Standing Orders, and to review protocols and procedures related to clinic operations, screening procedures, triage resources, and tracking systems.

Activity 8.4: Dispense vaccinations

The primary task of mass prophylaxis clinics is to dispense the appropriate medication and dosage to the population. As noted above, volunteers and staff received training prior to clinics on H1N1 safety information and vaccination procedures. Some vaccinators worked alone while others were paired for mentoring purposes or to support family vaccinations.

Each type of clinic was organized differently. For example, school-based clinics were typically organized by class. The “school picture model” was familiar to teachers and administrators and worked well for orchestrating the flow of students. However, the details of clinic operations were not provided in most focus group discussions.

Activity 8.5: Conduct triage for symptoms

Triage was often performed before and after persons received the H1N1 vaccine. Prior to being vaccinated, most public health clinics had a person or persons responsible for screening individuals for the presence of flu-like symptoms, for previous history of allergic reaction to seasonal flu vaccine, eggs or latex. Persons with health conditions, such as asthma, also needed to be identified in order to prevent their receipt of flu mist. Persons receiving vaccine for the first time also were asked to wait in a designated area for 15-20 minutes after being vaccinated in order to assess their risk for an adverse reaction. Each clinic typically had persons designated to fulfill these roles.

Activity 8.6: Evaluate mass prophylaxis operations

Although not specifically identified as a key responsibility under this capability, many participants reported the importance of self-assessment and evaluation built in to mass prophylaxis operations. The formality of these assessments varied, with the size of a clinic having some influence on the scope and degree of formality. More formal assessments often occurred right after the closing of a clinic and included discussion of a pre-determined set of questions asked of clinic staff. Less formal evaluations occurred during meetings with key operations staff. Some documented their discussions, others did not. Nearly everyone reported using the evaluation process as a way of identifying improvements in the organization and operation of future mass prophylaxis clinics.

Observations and Analysis

By and large, most participants reported having adequate, staff for vaccination clinics in part due to the use of MRC and volunteer nurses. During the planning stages, some experienced unexpected challenges from personnel they thought would play a major role in at least the targeted vaccine efforts. School nurses were one such group. In multiple communities, at least some school nurses reported feeling uncomfortable vaccinating children they care for on a regular basis. Most concerns revolved around the unknown impact that being a vaccinator would have on their image as trusted and caring resources for students. Some flat out refused to vaccinate children under their care. In these communities, local public health officials invested time and energy getting school nurses to see their role in a different light: since they are trusted resources, children may feel more comfortable being vaccinated by school nurses than strangers. Time was also spent training school nurses on how to perform vaccinations. Other local public health officials simply found other roles for school nurses to play in clinics. For example, some were given the responsibility of screening persons waiting for vaccine to assess whether people were experiencing active symptoms, if they were eligible for flu mist, and if they had allergies or a history of allergic reactions to flu vaccine. Others were placed as information resources for people standing in line. Ultimately, challenges were worked out in most communities and school nurses were a valuable resource throughout the response period.

As noted in multiple sections throughout this report, one of the major challenges of local mass prophylaxis efforts was the delay in vaccine production and distribution to local public health. The delay led to early cancellations of scheduled clinics. Some were rescheduled and others were dropped all together. The small amounts of vaccine distributed during the first few weeks posed additional challenges to local public health officials. As noted in the Risk Management section of this report (Capability 5), limited vaccine supply required local public health officials and partners to decide who within their communities would receive the limited resource or hold off all together on administering vaccine until more was available. The majority of participants ultimately decided to hold off on vaccine administration until they could offer it to an entire risk group. Communities with local public health nurse had some additional capacity to organize small appointment-based clinics for pregnant women. A few communities also reported working together to deal with limited vaccine supplies. These tended to be smaller communities where 100 to 200 doses of vaccine were sufficient to vaccinate an entire group of children.

The delay in vaccine distribution had a number of impacts at the local level. Some have already been mentioned, such as the amount of time and resources required to inform the public and volunteers about clinic cancellations and the rescheduling of volunteers and advertisement of new ones. Some participants also expressed concerns that the cancellation of clinics impacted their reputation as capable resources within their communities. This was especially difficult as national news stories about flu clinics being held in other parts of the country were widespread. Phone

calls from the public, municipal leaders and school officials asking why local public health did not have vaccine to administer were difficult to answer, as most reported not having a good understanding themselves.

Once vaccine was readily available, the majority of focus group participants reported that targeted and mass vaccination clinics went smoothly and as planned. The initial clinics were the most challenging and where the majority of problems were encountered. It was during these initial clinics where many local public health officials realized that the experience of and training that most volunteers had received focused on adult immunizations. Few were thoroughly prepared for pediatric immunization clinics. As a result, clinic organizers ended up having to organize Just In Time trainings for immunization of pediatric populations. Some also reported arranging for less experienced vaccinators to be paired up with experienced pediatric providers until they were comfortable vaccinating children on their own.

Training of clinic personnel also varied in terms of strategy and thoroughness. Persons who reported training nurses ahead of time on the vaccination types, equipment and screening protocols reported smoother running clinics. In our review of several after action reports prepared by local communities and regions, some concerns were also raised regarding inconsistencies among clinic staff in following screening protocols. Other concerns included disparities in the preparation of clinic staff to administer vaccine and follow through with appropriate safety guidelines.

In several focus groups, participants from smaller municipalities described strategies for increasing their capacity to organize and operationalize mass prophylaxis clinics by taking a regional approach. The majority of western communities and a few communities in the northeast planned from the beginning to work in partnership with other communities and/or another healthcare partner to provide vaccinations to the public. There was resounding support for this approach, especially among communities with volunteer boards of health who have very few resources to develop, coordinate and implement plans. Collaborative or regional efforts were also identified as a benefit to staffing burnout. With the joint hiring of clinic coordinators, much of the logistical work of scheduling, advertising, and organizing clinics was reduced. Local universities also stepped in as critical partners for mass prophylaxis efforts. One college, for example, worked with multiple communities during the vaccine shortage period to increase the amount available at clinics. With an on-campus health center, they received vaccine earlier than local public health partners. They also trained and sponsored nursing students to support local clinics in the area.

On the other hand, a common theme heard in many coalitions was the confusion experienced and lack of guidance on how to make the original vaccine request to MDPH. During early planning phases, communities were asked to forecast and request for allocations based on the health department's capacity to provide vaccinations within their community. No direction of how to arrive at that number was given when the request was made nor was there any consideration or ability to take into consideration the allocations requested by other community providers to determine a realistic number. Allocations were then distributed based on a percentage of that number provided by the departments. This created confusion and disharmony between local health departments and MDPH as well as within coalitions when projections were seen as being inflated. Communities who requested realistic estimates of the vaccine they could administer to residents received less during the first allocations than those who, for example, requested enough for an entire population. Likewise, communities who decided to work collaboratively in the beginning received the same small amounts of vaccine, and individual communities who used realistic numbers, struggled with how they would conduct clinics with such small allocations.. This translated into a real disincentive to make realistic resource requests or to work regionally.

Few participants described their strategies for ensuring that children under the age of 8 received two doses of the vaccine. Most reported asking which dose was being administered, but few described sponsoring “second dose clinics.” One challenge that local public health officials faced on this front was a lack of understanding regarding which other providers within their communities were administering vaccine, especially to school-aged children. By the time some school clinics were organized and running, some percentage of the children had already received at least a first dose of the vaccine. This provided an additional layer of screening needed to ensure that a second dose was administered in the right intervals. Generally, participants reported that vaccination efforts within local communities or regions needed to be better coordinated between local public health and healthcare providers.

Finally, a number of participants described innovative strategies they developed to reach out to the general population and increase vaccination rates within their communities. The cancellation of early clinics combined with national news stories of a waning epidemic led to less demand for vaccination when it was finally available for the general public. Local public health leaders, understanding the epidemiological trajectory of flu viruses, considered it important to continue educating people about the importance of flu vaccine and offering it when possible. In several areas across the state, local communities worked together to offer flu vaccinations in popular public places, such as malls, commuter rails stations, and voting sites. Some concerns with liability did initially get raised in sites, particularly malls. But most were quickly resolved. Participants considered these “alternative sites” to be extremely successful and many reported interested in using them for seasonal flu vaccine sites in the future.

Recommendations

With more than a half a million residents vaccinated as a result of local public health’s mass prophylaxis efforts, this may be considered an area of strength. Years of planning and preparation for large vaccination efforts paid off for most local public health leaders. Existing EDS plans were good places to start during the planning phase and experience with the plans enabled practitioners to be flexible and adaptable to changing circumstances. Nonetheless, there were difficult and unexpected lessons learned along the way.

1. Allocation of resources, including vaccine, needs to be fair and consistent across the state. Guidance from MDPH regarding resource requests must be clear and should not rely solely on the perception of local public health officials with respect to needs. Someone should also be responsible for checking resource requests and monitoring variations across municipalities and regions. Emergency preparedness coalitions can mitigate some disparities or differences within their communities by coordinating approaches early in the planning phase
2. MDPH needs to develop a more equitable strategy for distributing scarce resources to local public health. Some efforts will be needed to explain the strategy and to regain the trust of local practitioners that following the guidance provided will not result in vast disparities again.
3. Trainings offered to volunteer vaccinators should include a component on working with children and persons with disabilities.
4. On-line registration strategies were surprisingly easy to implement within communities and helped improve the planning and efficiency of vaccination clinics. There are a variety of scheduling systems that are available to local boards of health and departments.
5. There are a variety of resources within communities that may be tapped to help with mass vaccination efforts. EMTs, nursing students, pharmacists, and pediatric nurses

- are a few of the resources that proved to be useful in local communities.
6. Provide advanced notice to local public health agents or their designees regarding the resources and vaccine types that are being distributed to them and as much advanced notice of delivery dates as possible.
 7. Reduce the number of vaccine types, especially during emergency situations. Many local public health officials reported that they will not order flu mist again as it added a layer of complication to vaccine clinics that was not necessary.
 8. Improve coordination of vaccine administration efforts within local communities. Work with healthcare providers to assess overlaps in populations served and develop a plan for vaccinating target populations without duplicating effort.
 9. Expand recognition of vaccination opportunities. Vaccinations offered in non-traditional settings were very successful and reached populations that may not have been reached through traditional communication strategies.
 10. Burnout is a real risk during mass prophylaxis efforts. Many communities have resources within their communities to support public health response and may need to expand their pool of volunteers to accommodate long-lasting health emergencies.
 11. MRC's and volunteers were instrumental to the vaccination effort in communities with limited staff and should continue to be included in planning efforts.
 12. A system of redistribution should be developed, with local health input to ensure vaccine is not being wasted. Plans for redistribution of vaccine from area providers should be incorporated into future planning strategies.

SECTION 4: CONCLUSION

I still consider this (H1N1) a minor test but the fact is that we did it. We did pull it off. The capacity for resiliency and flexibility was created by this long term building process that we've gone through as a region since 9/11... it makes you a little bit more positive toward the future. (focus group participant)

There is no question that the 2009-2010 H1N1 outbreak challenged local public health officials across the Commonwealth. Some of these challenges were expected, others were not. By the time that data was collected for this after action report, most public health officials felt as though they had been through the worst of it and were beginning to pick up the many pieces of their work that had been neglected for months. Despite the sheer exhaustion that was palpable during our discussions, local public health officials across the state highlighted almost as many lessons learned and positive outcomes of the public health event as they did negative ones.

The strengths in response at the local level included planning and partnership building, prevention, and capacity to rapidly adapt to changing circumstances. Most reported that years of planning for pandemic flu and other public health emergencies paid off. Previously developed EDS plans and Incident Command protocols, for example, provided a strong place to start during the planning phase. Previously established partnerships largely proved to be valuable resources. New partnerships formed due to the identified priority groups afforded opportunities to expand partnerships and develop relationships with other resources within their communities that will be utilized in the future.

The challenges, however, were many. Without question, the delay in vaccine production and distribution to local public health officials clouded many of the accomplishments achieved during the planning phase. Relationships within and across communities were strained at times, especially as scarce resources forced re-prioritization of who initially received vaccine and how communities worked together. Scheduling, cancelling, and re-scheduling vaccine clinics required large quantities of human resources to orchestrate. Some also felt that it negatively impacted the credibility of local public health to protect residents within their communities.

One silver lining of some of the challenges encountered as a result of vaccine was the motivation towards innovation. Some practices for preventing and vaccinating populations were so successful that plans were in place to utilize them again for seasonal flu clinics. "Put the vaccine in their path," was a mantra commonly echoed in focus group discussions. Many found ways of successfully getting information out to residents in new forums and providing vaccinations in non-traditional sites. In smaller communities, the challenges of providing mass vaccinations to residents led many to working regionally with multiple communities. For the most part, regional approaches greatly expanded capacity and capability to prevent and mitigate H1N1 infections.

In summarizing the many different experiences and approaches we heard through this process, several recommendations rise to the top. These recommendations and associated practices could have an impact on multiple capabilities in future infectious disease emergencies.

General Recommendation 1: Improve communications between state and local public health

The majority of focus group participants described the need for better communication and transparency in decision-making between state and local public health officials. State and local

public health officials are partners in response to health emergencies. Both have unique perspectives and, when brought together, may improve planning and response efforts. Strategies identified for improving communications included greater involvement of local public health officials in the planning stages of a health emergency, improvements in the vertical flow of information so that timely feedback loops are built into communication strategies, and utilization of the LSAC, CLPH and regional emergency preparedness coordinators as conduits for information sharing from and to local and state public health leaders.

General Recommendation 2: Improve coordination across health, public health and community-based organizations

Many of the challenges and inefficiencies in response stemmed from a lack of coordination and collaboration across health and public health disciplines. This was true both within and across communities. Relationship building with healthcare providers was recognized as a need among many public health officials. This is a critical first step towards improved coordination of services. Finding the right people to collaborate with is also important. MDPH can also support coordination of resources and services in a number of ways. For example, knowledge of who within a given community or region was receiving vaccine could have helped providers coordinate a plan for vaccinating target populations and the general public and possibly a better system for redistribution of vaccine. Having a coordinated plan could then inform outreach and coordination planning, especially during times of scarce resources. It would also help local providers assess strengths and gaps in reaching target populations. Strategies recommended for improving communication and coordination within local communities included partnership building, joint planning, sharing resource requests from various providers within communities from the beginning of an infectious disease event, and on-going communications throughout public health events.

General Recommendation 3: Continue planning, exercising, and building local and regional capacity

Planning for the unexpected is difficult to do. Repeatedly we heard questions regarding how to plan for the kind of flexibility and adaptability that was needed for the response to H1N1. What we learned in our discussions across that state was that years of planning and exercising had truly helped prepare local officials to respond to many of the challenges they faced over the last year. Existing plans provided a good place to begin thinking about mass vaccination efforts. EDS site plans, including descriptions of the incident command structure, station descriptions, and job action sheets were useful for a variety of different clinic types. More important, however, was the knowledge and understanding of what needed to be accomplished and how generally to proceed. This base of understanding created the capacity to modify and change plans as needed. While there may not be a way to formally build flexibility into existing plans, efforts to create experiential learning opportunities may ultimately be the best way to ensure a competent and prepared public health workforce.

This report represents one of many efforts to learn what we can from the 2009-2010 H1N1 experience. There are many areas for improvements that are reflected in the body of this report and the Appendix A: Improvement Plan. While some of the lessons learned emerged from challenges and failures, many also emerged from successes and innovative practices. Local and state public health officials in Massachusetts have much to be proud of as they reflect on their experiences over the past year. We hope that the collective wisdom represented in this report will help inform preparation and response for future public health emergencies and events.

APPENDIX A: IMPROVEMENT PLAN

This IP has been developed specifically for local and state public health officials in Massachusetts as a result of the Massachusetts Local Public Health H1N1 Response conducted August 2009 to May 2010. These recommendations draw on the After Action Report.

Table A.1: Improvement Plan Matrix

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
1: Intelligence and Information Sharing and Dissemination	1. Include local public health representatives in the planning of communication strategies from the federal to state to local levels.	Planning Communication	LPH/MDPH/CDC
	2. Develop protocols to ensure that information is communicated to local public health officials and other emergency responders prior to public dissemination. Continue to utilize the LSAC and CLPH to disseminate information	Policy Communication	MDPH
	3. HHAN was under-utilized as a strategy for quickly communicating information and updates to local public health officials. Ensure that local public health officials, including board of health members, have HHAN accounts and are trained to receive and retrieve information transmitted via the HHAN.	Training Communication	LPH/MDPH
	4. MDPH should expand its outreach to other state-level agencies to ensure that consistent messages are being transmitted to all persons at the local level who are impact by a public health emergency.	Organization Communication	MDPH
	5. Consistent and on-going communications across all levels of government and between key personnel within communities is essential. Communication strategies, including frequency of meetings, meeting formats, and decision-making protocols should be discussed early in the planning stages of a public health response.	Planning Communication	LPH and Emergency Preparedness Teams/MDPH/CDC

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	6. Transparency in decision-making across all levels of government and among partners is critical for a consistent response within and across communities.	Communication	LPH/MDPH/CDC
2: Planning	1. On-going drills and exercises are important for the maintenance of plans, partnerships and knowledge-base. Multi-disciplinary exercises will help support on-going relationship building and understanding across disciplines.	Training Partnership	LPH and EPCs/MDPH
	2. Partnership building can happen during an emergency situation, but it is not ideal. Communities with existing relationships with affected partners (e.g., local schools, healthcare providers, child care centers) reported fewer difficulties during the planning stages with bringing people together to develop a response plan.	Planning Partnership	LPH/MDPH
	3. Engage high-level school and hospital administrators early on.	Planning Partnership	LPH/MDPH
	4. Engage local media early on.	Planning Partnership	LPH
	5. Although many early plans did not play out, the process of bringing people together and to establish plans helped communities work together to face the challenges of delayed vaccine.	Planning Partnership	LPH
	6. Local universities are valuable resources during emergencies. Public health nursing students, for example, can increase the capacity of local communities to operate public vaccination clinics.	Partnership Resources	LPH/MDPH
	7. Providing an emergency order and training to an expanded group of vaccinators helped the vaccination effort and should be replicated in future public health emergencies requiring mass vaccination	Training Organization	LPH/MDPH

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	8. All colleges and universities do not have the same capacity to care for their student bodies. Community colleges were often left out of local planning efforts. Partnership building with university and college leaders is necessary.	Planning Partnership	LPH
	9. Coordination of human and material resources is very time consuming. Planning and funding for essential positions like MRC volunteer coordinators and clarifying roles and responsibilities early on is important.	Planning Organization	LPH
	10. The need for MDPH to receive local input during the planning stages either through focus groups, advisory councils, LSAC or CLPH is imperative.	Planning Communication	MDPH/LPH
3: Epidemiological and Surveillance Investigation	1. Local surveillance systems to monitor symptoms are worth developing early in the planning phase of a public health event. Surveillance data can help identify increases in illness, inform the need for additional education and prevention messaging, and help direct resources for prevention and mitigation.	Resources	LPH
	2. Establishing good working relationships with school officials, hospital and health center administrators, and healthcare providers is essential. All partners who gather and receive data need to have a mutual understanding of respective roles and responsibilities during emergencies.	Partnership	LPH
	3. Clarity around the use of surveillance data is needed during the planning phase of a public health event. Protocols and procedures for sharing and receiving information need to be in place in order to protect confidentiality.	Planning Policy	LPH/MDPH

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	4. More coordination and detail of information from MDPH at the local level regarding resource requests is needed in order to be able to track vaccine administration and plan mitigation efforts within a given locale.	Organization Communication	MDPH/LPH
	5. MDPH can take a leadership role in requiring the collection of data used to assess the extent and reach of vaccine administration within communities. MDPH could bring a group of local public health directors and public health nurses, healthcare, and emergency managers together to identify what data should be collected, how it should be collected, and reporting formats.	Planning Organization	MDPH
4: Emergency Public Information and Warning	1. Utilization of large communication systems, such as Connect-ED and Reverse 911 proved to be effective and efficient methods for communicating certain types of information and should be expanded.	Resources Communication	LPH
	2. Early engagement of providers or persons connected to high risk populations was a good way to reach target populations. Existing distribution lists, such as those for licensed daycare providers and licensed nurses, should be maintained and regularly updated.	Partnership Communication	LPH
	3. Work closely with municipal and institutional Public Information Officers when possible. Connect with Public Information Officers from partner institutions to effectively disseminate information to the public.	Partnership Communication	LPH
	4. Proactively engage local media sources to communicate information to the public and “stay ahead” of alarmist news stories. Prepare stories for publication rather than having a reporter develop them to ensure accuracy. MDPH should provide templates to local health to ensure consistent messaging	Partnership Communication	LPH/MDPH

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	5. Identify human resources within each community that work with specific populations who may not be reached through general communication strategies. Outreach workers, nurses, community service providers, clergy, and some business owners can be useful resources.	Resources Communication	LPH
	6. MDPH should play a stronger role in controlling local and state media sources. Active rebuttal of inaccurate information at the state level would be a more efficient way of reducing some public concerns than each community dealing with it on their own.	Communication	MDPH
	7. MDPH should work with MMA to ensure medical providers are giving accurate and CDC/MDPH sanctioned information to their patients to prevent miscommunication	Communication	MDPH
5: Risk Management	1. MDPH and the CDC must increase their communication with local public health on the rationale behind risk assessments and vaccine prioritization, and must remain consistent with their messaging. They must be willing to back up local health when challenged by the public.	Communication	MDPH
	2. At the state level, and preferably in cooperation with nearby states, a central authority must be identified as having the responsibility to mandate target populations for vaccination and ensure cross-jurisdictional uniformity. By centralizing responsibility for risk assessment and management, officials with the information necessary to make decisions will also have the authority to act on that information.	Policy	MDPH/CDC

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	3. Identify resources and procedures for translating risk communication materials into other languages. MDPH and the CDC are good places to start, although some translations were not appropriate for certain dialects. Community outreach workers and hospital translation services are good resources.	Resources Communication	LPH/CDC/MDPH
	4. At the local, state and national level, communication networks between public health and healthcare providers must be developed to ensure consistent communication to the public and allow for procedures to be established that describe the role of providers in public health emergency scenarios, including responsibilities for vaccination and surveillance.	Communication	LPH/MDPH/CDC
	5. Proactive rebuttal from MDPH regarding safety concerns for vaccine would increase efficiency in allaying public concerns and reduce individual burden on every local public health officials to challenge misperceptions. Large scale public service announcements from trusted leaders delivered in a timely fashion are recommended.	Communication	MDPH/CDC
	6. Strong partnerships are needed to reach the diverse populations that live in the Commonwealth. Coordination and planning with state and local leaders, like the Massachusetts Medical Association and clergy, are critical to education and outreach efforts.	Partnerships Communication	LPH/MDPH
6: First Responder Safety and Health	1. A clear definition of “first responder,” including situation- or incident-specific first responders, is needed. The local interpretation of “first responder” can lead to vast differences in who is targeted for training, protection, and prevention measures across communities.	Policy	MDPH/CDC

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	2. MDPH can play a leadership role in ensuring that other state agencies, including public safety, understand the rationale for first responder vaccination priorities. Widely publicize criteria for prioritization as appropriate.	Communication	MDPH
	3. Coordinate communication between public health, education and public safety at the state level to ensure local officials in all three areas are hearing a consistent message. Messages for each department should be disseminated from the state to the local level, rather than between local officials.	Communication Organization	MDPH
	4. Emergency preparedness coalitions may take a more proactive approach to limiting controversies surrounding the vaccination and prevention measures directed towards public safety officials. Inconsistencies in following the guidance for priority groups pose challenges across communities. Coalitions may agree ahead of time to follow the same protocols and procedures to facilitate mutual collaboration across disciplines and municipalities.	Partnership Policy	Regional Emergency Preparedness Coalitions
	5. In the absence of being able to offer vaccine to first responders, “safety kits” and other prevention resources were appreciated and used.	Partnership Resources	LPH
	6. Utilizing a process for tracking PPE supplies available within a community may require a more coordinated effort with first responders especially if supply shortage is expected	Resources Organization	LPH
	7. Immunizing MRC members and volunteers who provided surge capacity for local health vaccination efforts, should be considered, as they were needed to ensure an adequate workforce in the local health immunization effort.	Resources Organization	LPH

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	8. MDPH needs to establish a better communication and distribution system with EMS councils.	Communication	MDPH
7: Isolation and Quarantine	1. Outreach to businesses to encourage them to update sick leave policies to prepare for pandemics, including clauses for telecommuting and parental sick leave when appropriate.	Policy	LPH
	2. Establish a network of communication on between schools, public health and healthcare centers to disseminate sick policies and increase public health surveillance capabilities.	Communication Organization	LPH
	3. Public health officials at all levels of government need to increase support for voluntary isolation and quarantine measures in advance of a future pandemic.	Policy	LPH/MDPH/CDC
	4. Assess and suspend practices that provide “perverse incentives” to not stay home. Education regarding why certain practices may not be the best for public health may be needed to gain support for suspended practices.	Communication Policy	LPH/MDPH
	5. MDPH develops an exclusion order as soon as possible to assist with enforcement of isolation and quarantine requirements	Policy	MDPH
8: Mass Prophylaxis	1. Allocation of resources needs to be fair and consistent across the state. Guidance from MDPH regarding resource requests must be clear. Responsibility for checking resource requests and monitoring variations across municipalities and regions must be assigned. Provider allocations should be considered in the community allocation decisions. Emergency preparedness coalitions can mitigate some disparities within their communities by coordinating approaches early in the planning phase.	Resources Organization	MDPH and EPCs

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	2. MDPH needs to develop a more equitable strategy for distributing scarce resources to local public health. Some efforts will be needed to explain the strategy and gain the trust of local practitioners that following the guidance provided will not result in such disparity again.	Policy Communication	MDPH
	3. Trainings offered to volunteer vaccinators should include a component on working with children and persons with disabilities.	Training	MDPH
	4. On-line registration strategies helped improve the planning and efficiency of vaccination clinics. There are a variety of scheduling systems that are available to local boards of health and departments.	Resources	LPH
	5. There are a variety of resources within communities that may be tapped to help with mass vaccination efforts, such as EMTs, nursing students, and pediatric nurses.	Resources	LPH
	6. Provide advanced notice to local public health agents or their designees regarding the resources and vaccine types that are being distributed to them and as much advanced notice of delivery dates as possible.	Communication	MDPH
	7. Reduce the number of vaccine types, especially during emergency situations. Many local public health officials reported that they will not order flu mist again as it added a layer of complication to vaccine clinics that was not necessary.	Resources	MDPH/CDC
	8. Improve coordination of vaccine administration efforts within local communities. Work with healthcare providers to assess overlaps in populations served and develop a plan for vaccinating target populations without duplicating effort.	Organization Partnership	LPH/MDPH

APPENDIX A: Improvement Plan			
Capability	Recommendation	Capability Element	Primary Responsible Agency
	9. Expand recognition of vaccination opportunities. Vaccinations offered in non-traditional settings were very successful and reached populations that may not otherwise have been reached.	Organization Facilities	LPH
	10. Burnout is a real risk during mass prophylaxis efforts. Many communities have resources within their communities to support public health response and may need to expand their pool of volunteers to accommodate long-lasting health emergencies.	Resources	LPH
	11. MRC's and volunteers were instrumental to the vaccination effort and should continue to be included in the planning efforts	Resources	LPH
	12. A system of redistribution should be developed with local health input to ensure vaccine is not being wasted.	Resources	LPH

APPENDIX B: MAJOR EVENTS TIMELINE

Table B.1: Major Events Summary Table

Date	Event/Action
April 2009	Local public health officials start planning for H1N1 response
April-June, 2009	Some towns conduct surveillance in schools
Summer 2009	Local public health officials begin to engage schools and other partners in planning efforts
Late August/Early September 2009	MDPH instructs local public health officials to finish seasonal flu clinics by October in order to be ready for H1N1 clinics
September 9, 2009	MDPH came to Berkshires to discuss preparations for H1N1 with public health, providers and other partners
September 14, 2009	Commissioner issues order allowing paramedics, dentists, medical students, nursing students, and pharmacists to vaccinate
September 30, 2009	Statewide H1N1 Preparedness Conference held in Worcester. Over 800 people attended in person and more than 500 registered to watch the live webcast.
October 1, 2009	Statewide Flu Summit; placed first order for 35,000 vaccines in Massachusetts
October 5, 2009	Massachusetts receives first H1N1 vaccine shipments: approximately 36,000 courses of the nasal spray containing live virus that could not be given to targeted risk groups and was targeted for healthcare workers
October 6, 2009	Healthcare providers begin to receive H1N1 vaccine
October 7, 2009	Weekly statewide conference calls resumed for all local health, hospital, EMS, EMA, public safety, college and school personnel; approximately 700 lines are available for the calls held each Wednesday from 3:00-4:30 pm
October 13, 2009	By this date, the total allocation of H1N1 vaccine in Massachusetts is 218,200 doses, or 5.95% of expected total
October 15, 2009	ETA for H1N1 vaccine announced by CDC passes with many towns not having received vaccine
October 19, 2009	MDPH begins to receive complaints that some individuals cannot find the vaccine.
October 25, 2009	H1N1 influenza outbreak declared a national emergency
October 27, 2009	MDPH established two tiers within CDC's vaccine priority group, focusing on pregnant women and children
October 29, 2009	MDPH required institutions to offer vaccine to all healthcare workers. Workers could opt-out, but had to sign a Release.
November 4, 2009	Minimum shipment of 100 doses goes out to any HCP site that registers with MDPH
November 5, 2009	Many schools in Massachusetts see an increase in H1N1 flu
November 9, 2009	Local health allocations of vaccine shift from 25% to 50%
November 13, 2009	By this date, approximately 875,000 doses of the H1N1 vaccine distributed to healthcare providers throughout Massachusetts
November 15-21, 2009	National news cites a decrease in H1N1 activity

Table B.1: Major Events Summary Table Cont'd

Date	Event/Action
December 3, 2009	Massachusetts expands vaccination categories to include individuals up to the age of 64 with underlying health conditions that put them at particular risk for complications of influenza
December 6, 2009	Local public health officials hear it is permissible to vaccinate the general public
December 10, 2009	The amount of flu-like illness in the state downgraded from "Widespread" to "Regional" activity
December 17, 2009	By this date MDPH has distributed over two million doses of the H1N1 vaccine -- enough to protect the vast majority of residents at highest risk against the H1N1 flu; MDPH expands vaccination recommendations to all residents
December 19, 2009	The amount of flu-like illness in the state downgraded from "Regional" to "Local" activity
Mid-January, 2010	Local public health expands vaccination efforts, holds clinics at voting stations and malls
January 31, 2010	By this date 3.7 million doses of vaccine were distributed in Massachusetts
February 18, 2010	The level of flu-like illness in the state has decreased to an even lower level than what is expected for this time of year and remains so for the remainder of the flu season
May 2010	Local public health officials continue to hold flu clinics with remaining vaccine, but attendance is poor

APPENDIX C: ACRONYMS

Table C.1: Acronyms

Acronym	Meaning
AAR	After Action Report
BPHC	Boston Public Health Commission
CDC	Centers for Disease Control and Prevention
CLPH	Coalition for Local Public Health
CRI	City Readiness Initiative
COOP	Continuity of Operations Plan
EDS	Emergency Dispensing Site
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
FOUO	For Official Use Only
GAO	Government Accountability Office
HHAN	Health and Homeland Alert Network
HSEEP	Homeland Security Exercise and Evaluation Program
ICH	Institute for Community Health
ICS	Incident Command System
IP	Improvement Plan
LSAC	Local State Advisory Committee
MAHB	Massachusetts Association of Health Boards
MDPH	Massachusetts Department of Public Health
MAPHN	Massachusetts Association of Public Health Nurses
MEHA	Massachusetts Environmental Health Association
MHOA	Massachusetts Health Officers Association
MPHA	Massachusetts Public Health Association
MRC	Medical Reserve Corp
NACCHO	National Association of County and City Health Officials
NGO	Non-Governmental Organization
NIMS	National Incident Management System
PHEP	Public Health Emergency Preparedness
PHER	Public Health Emergency Response
PIO	Public Information Officer
PPE	Personal Protective Equipment
SHI	School Health Institute
SNS	Strategic National Stockpile
TCL	Target Capabilities List
VNA	Visiting Nurse Association

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AFTER ACTION REPORT/IMPROVEMENT PLAN

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