EXECUTIVE SUMMARY

★ REAL EVENT ★

New Jersey Department of Health and Senior Services 2009 Influenza A (H1N1) Virus Response during April 25, 2009 through March 31, 2010

OF THE AFTER ACTION REPORT/IMPROVEMENT PLAN

July 15, 2010

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New Jersey Stakeholders

Special thanks to the stakeholders who attended the April 9, 2010 summit and submitted survey reports. The feedback on their work effort and experiences was provided graciously and freely. A complete list of names may be found in Appendix A.

EXECUTIVE SUMMARY

Influenza (also known as the flu) is a contagious respiratory illness caused by viruses. Symptoms include fever, muscle ache, sore throat, and headache. Influenza can be fatal and is of particular concern to the elderly, the very young, and those with underlying medical conditions. Influenza viruses constantly change to avoid being destroyed by the immune system, the body's major defense against diseases. Each year, individuals are reminded to get their flu vaccine prior to the onset of flu season. Seasonal flu vaccines are typically comprised of three virus strains. These strains are selected by scientists based on the results of intensive surveillance activities and a prediction of what viruses will be circulating in the upcoming flu season.

In early 2009, a new strain of influenza virus emerged. The novel influenza A (H1N1) virus, which contains avian, swine, and human components, was the result of an abrupt and unanticipated viral reassortment or "shift." As most individuals did not have immunity to this virus, it spread rapidly in many countries including the United States and across continents. The World Health Organization declared an official pandemic in June 2009.[1] Between March 1, 2009 and April 30, 2010, New Jersey had 3,657 cases of H1N1 (3,178 confirmed, 479 probable) with 42 deaths.[2] In New Jersey and elsewhere, children, pregnant women, and those with underlying medical conditions such as asthma, diabetes, and heart disease were disproportionately affected by the virus. Since far fewer H1N1 cases were observed among the elderly, they were not considered a high risk population.

Within the New Jersey Department of Health and Senior Services (NJDHSS) are several divisions and programs that played a major role in Departmental response to the 2009 influenza A (H1N1) virus: the Division of Health Infrastructure Preparedness and Emergency Response (HIPER); the Communicable Disease Service (CDS); the Public Health and Environmental Laboratories (PHEL); and the Office of Public Health Infrastructure (OPHI). The mission of HIPER is to provide strategic and operational leadership, direction, coordination, provision of services, and assessment of activities in an effort to ensure state and local readiness in response to acts of terrorism, natural disasters, and other public health threats and emergencies. This includes infectious disease outbreaks such as pandemic influenza. The CDS is the state's lead agency for infectious disease control and prevention. Since 2000, the CDS performs statewide surveillance of influenza-like illness (ILI).[3] The purpose of surveillance is to observe ILI trends and detect outbreaks. The CDS Vaccine Preventable Disease Program serves as Departmental liaison to the federal Centers for Disease Control and Prevention (CDC) on vaccine issues, of particular importance in vaccine-preventable pandemic scenarios. Among the many services offered by the PHEL is the testing and identification of clinical specimens for influenza viruses.

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[1] Influenza pandemics typically come in waves with each wave increasing in lethality.

[2] Initially, only specimens testing positive for H1N1 by a state public health laboratory using Centers for Disease Control and Prevention-approved methodologies were assigned a confirmed status; a probable status was assigned if the specimen was analyzed by a commercial laboratory. In October 2009, the case definition was relaxed to include confirmation by laboratories other than state public health laboratories.

[3] Hamby, Teresa et al. Communicable Disease Surveillance in New Jersey. Supplement to New Jersey Medicine. Volume 101, number 9. September 2004.

The OPHI is the Department's direct link to 106 New Jersey local health departments and associated workforce. Its mission is to strengthen public health services, planning, and community health assessment performed at the municipal, county, and regional level. The OPHI is also responsible for the examination and licensure of New Jersey Health Officers and Registered Environmental Health Specialists.

Commensurate with the four homeland security missions to *prevent, protect, respond*, and *recover* from an incident or emergency event, a framework was in place to confront the 2009 influenza A (H1N1) virus. This framework was comprised of but not limited to the following.

- Two **pandemic influenza plans** were available for administration: a statewide and NJDHSS-specific plan. Both plans provided standard operating procedures for responding to an influenza pandemic. The plans also refer to pre-approved templates used in press releases and public health messaging.
- The **Health Command Center** located within the NJDHSS Trenton, New Jersey headquarters served as the Department's communications and operations hub for statewide partners. Weekly interdepartmental updates as well as an April 30, 2009 press conference featuring then-Governor Jon Corzine were staged at the Health Command Center. Updates were also made available to stakeholders via videoconferencing.
- Situated in nine hospitals located throughout New Jersey, **Medical Coordination Centers** (MCCs) served to assist in providing a regionalized interface for communications and information gathering for 2009 influenza A (H1N1) virus response.
- The **Local Information Network and Communications System (LINCS)** provided an electronic system for the prompt delivery of pertinent public health alerts, advisories, updates, and information on the 2009 influenza A (H1N1) virus.
- There are 21 New Jersey health departments designated as **LINCS agencies**. These agencies are responsible for all-hazards emergency preparedness and response activities; they played a pivotal role during the 2009 influenza A (H1N1) virus pandemic.
- The **New Jersey Immunization Information System (NJIIS)**, a confidential, population-based registry used to track child vaccination data, served as a platform for the CDS **H1N1 Vaccine System**. The H1N1 Vaccine System was created as a centralized vaccine ordering, inventory, and distribution center. It also provided vaccine storage temperature logs and was used to record vaccine doses administered.
- **Hippocrates**, the situational awareness web-based application, was used to track daily hospital admissions and emergency department visits to gauge the temporal and geographic spread of the 2009 influenza A (H1N1) virus.
- With oversight by the HIPER Office of Emergency Planning, two shipments of **Strategic National Stockpile (SNS)** supplies were delivered to New Jersey (May 2009; January 2010). These supplies were comprised of antiviral medications, syringes, and personal protective equipment. Utilizing a **Mass Prophylaxis Plan**, the Office of Emergency Planning received and distributed SNS supplies to 21 LINCS agencies at designated Receipt, Staging, and Storage sites.
- The HIPER **Risk Communications Manager** was designated as the Public Information Officer for the 2009 influenza A (H1N1) virus. Working closely with the NJDHSS Office of Communications, a public information campaign was implemented which utilized social media (i.e., Facebook, Twitter, YouTube) as well as traditional methods (e.g., press releases,

public service announcements, bus advertisements). Additionally, the Risk Communications Manager was responsible for the development of public health messages and intra-Departmental communications.

- The HIPER **Exercise Support Team** assists stakeholders in identifying, planning, designing, training, conducting, and evaluating exercises related to emergency events that have public health or medical consequences. This has included mass prophylaxis exercises in preparation for pandemic influenza. The Exercise Support Team annually sponsors a Training and Exercise Planning Workshop which builds capabilities, inspires teamwork, and enhances interagency response to public health threats.

Capabilities

The emergence of the 2009 influenza A (H1N1) virus tested the ability of the NJDHSS and stakeholders to perform the following target capabilities: 1) **Mass Prophylaxis**; 2) **Medical Supplies Management and Distribution**; 3) **Critical Resource Logistics and Distribution**; 4) **Emergency Public Information and Warning**; 5) **Public Health Laboratory Testing**; and 6) **Epidemiological Surveillance and Investigation**.[4] Stakeholders were comprised of numerous, diverse organizations and individuals including but not limited to the following.

- **New Jersey Health Officers**. New Jersey licensed Health Officers serve as the lead public health official for municipalities, counties, or regions. These professionals have met stringent training, education, and experience requirements, passed a state examination, and attain minimum continuing education units each year.
- **New Jersey Hospitals**. The goal of New Jersey hospitals and affiliated health systems is to provide quality, accessible, and affordable health care to patients. Utilizing specialized staff and equipment, diseases and injuries are diagnosed and treated. New Jersey hospitals are required to report notifiable communicable diseases to the NJDHSS.
- **Federally Qualified Health Centers (FQHCs)**. FQHCs are authorized by the U.S. Department of Health and Human Services to provide health care to medically underserved populations. FQHCs were among the 3,638[5] registered H1N1 vaccine provider sites.
- **New Jersey Department of Education (NJDOE), New Jersey Department of Human Services (NJDHS), other state departments.** The NJDOE oversees the state's grades K through 12 school system. In cooperation with the CDC and NJDHSS, the NJDOE provided guidance on school dismissals related to the 2009 influenza A (H1N1) virus. Due to stress, anxiety, and frustration associated with the initial unavailability of both H1N1 and seasonal flu vaccines[6] as well as reports of deaths among children, the NJDHS made available free mental health services (e.g., counseling, coping skills) to the general public.

[4] Target Capabilities List: A Companion to the National Preparedness Guidelines. U.S. Department of Homeland Security. September 2007.

[5] Seventy-two percent (2,612/3,638) of the registered H1N1 vaccine provider sites ordered and received vaccine.

[6] During the first wave of the 2009 influenza A (H1N1) virus pandemic, H1N1 flu vaccine production took precedence over seasonal flu vaccine production.

- **Physicians**. Through the study, diagnosis, and treatment of disease and injury, physicians maintain or restore human health. They have expressed varying opinions (both pro and con) regarding the safety and efficacy of vaccines including the 2009 H1N1 flu vaccine.
- **Vaccine Manufacturers**. In September 2009, the U.S. Food and Drug Administration (FDA) approved four companies to manufacture vaccine for the 2009 influenza A (H1N1) virus. Three of the four companies manufactured inactivated vaccine in prefilled single or multi-dose syringes; the fourth manufactured live attenuated intranasal spray.[7]
- **Pharmacies**. In addition to selling both over-the-counter and prescription medicines, pharmacies often provide an array of health services such as blood pressure testing, cholesterol screening, and flu vaccination clinics. They were also included among registered H1N1 vaccine provider sites.
- **Employee Health Services**. Many New Jersey businesses contacted the NJDHSS to discuss strategies to protect and promote employee health as well as the health of clientele. Correspondingly, corporations such as Goldman Sachs, Citigroup, and JPMorgan Chase were among the first in the United States to receive the 2009 H1N1 flu vaccine. While commendable that these corporations sought to protect their employees, it stirred controversy throughout the nation. Following the first wave of the pandemic, many pregnant women, health care workers and emergency medical service providers having direct patient contact, and others waited in line for hours at flu clinics or were turned away due to insufficient vaccine supplies.
- **Volunteer Groups**. Volunteer groups such as the Medical Reserve Corps (MRC) provide critical support to communities during natural disasters and emergencies. During the 2009 influenza A (H1N1) virus pandemic, MRC volunteers served a vital role particularly in vaccine administration at flu clinics.
- **Faith Based and Special Needs Organizations**. Engagement of these stakeholders was crucial to the NJDHSS in ascertaining the needs of their constituencies. Likewise, these organizations served as a conduit for NJDHSS messages on 2009 influenza A (H1N1) virus preparedness and response efforts.

Purpose of Executive Summary

Based on feedback provided by stakeholders during an April 9, 2010 pandemic influenza summit meeting, the Exercise Support Team was tasked with preparing an After Action Report/Improvement Plan (AAR/IP) on Departmental preparedness and response to the 2009 influenza A (H1N1) virus. This Executive Summary serves as an accompaniment to a forthcoming AAR/IP.

[7] Update on Influenza A (H1N1) 2009 Monovalent Vaccines. Morbidity and Mortality Weekly Report. October 9, 2009. Volume 58, no. 39. Pages 1100-1101.

Major Strengths

Several major strengths were identified during NJDHSS response to the 2009 influenza A (H1N1) virus.

1. The NJDHSS received over $40,000,000 from the CDC for 2009 influenza A (H1N1) virus preparedness and response activities. These activities included epidemiologic disease surveillance, mass vaccination, emergency supplies distribution, and laboratory testing. Besides high risk groups, the NJDHSS targeted medically underserved, vulnerable, minority, and hard to reach populations. Seventy percent of funding was channeled directly to local health departments, LINCS agencies, hospitals, FQHCs, and satellite emergency departments. Remaining funds were used by the NJDHSS for the H1N1 Vaccine System, PHEL virology testing services, a public information campaign, and other projects. Stakeholders concurred that CDC funding was more than sufficient and that the HIPER Office of Infrastructure Preparedness and Emergency Response Policy (grants administration staff) were extremely helpful. Standardized forms were developed by grants administration staff for use by local health departments and LINCS agencies in tracking and reporting expenditures. Additionally, all local health departments were placed on advanced payment schedules so that funds could be readily disbursed. Stakeholders commented that it would have been helpful to have had funding specifically identified as "H1N1" since funding was disbursed in increments. They also recommended that a funding base be established well in advance of an emergency incident or event.

2. PHEL staff performed virology testing services in an exemplary manner during a particularly high stress period. Between April 25, 2009 through March 31, 2010, the PHEL received 3,554 respiratory specimens (nasopharyngeal swabs, nasal washes, tissue) for 2009 influenza A (H1N1) virus testing. Using real-time reverse transcriptase-polymerase chain reaction (RT-PCR) and viral culture methodologies, all specimens were tested for the influenza A (H1), A (H3), and B viruses; if indicated, a second set of tests were performed to confirm the 2009 influenza A (H1N1) virus. Forty-one percent (1,462/3,554) of the specimens were confirmed to contain the 2009 influenza A (H1N1) virus. Laboratory turn-around-time ranged from 24 to 72 hours with the average turn-around-time being 48 hours.

3. Two call centers were established by the NJDHSS to handle 2009 influenza A (H1N1) virus inquiries: a public call center (PCC) and an emergency communications center (ECC). The PCC (located at the Somerset Medical Center MCC, Somerset County, New Jersey) was responsible for responding to public inquiries.[8] During Spring 2009, the PCC was comprised primarily of NJDHSS and Medical Reserve Corps staff who answered questions on the H1N1 virus, exposure prevention, school dismissals, et cetera. Between October 2009 and April 23, 2010, the PCC was staffed by NJDHSS and as many as 24 temporary personnel hired with CDC funding. The majority of calls received during this time frame had to do with the availability and location of H1N1 flu vaccine clinics and course of treatment. PCC staff utilized a "phone script." This script, developed by CDS health education staff in conjunction with the HIPER Risk Communications Manager, was updated 47 times to ensure call center staff provided accurate, up-to-date, and consistent information.

[8] H1N1 Call Center: the Central West Medical Coordination Center. After Action Report/Improvement Plan. NJDHSS. June 11, 2009.

Between April 25, 2009 through PCC closing on April 23, 2010, the PCC received nearly 40,000 calls from New Jersey residents, residents of 28 other states, and the District of Columbia. The ECC was established for medical and public health professionals. Between April 27 through May 14, 2009, the ECC received 1,165 calls primarily from local health departments, LINCS agencies, schools, worksites, and health care providers. Questions asked included follow-up on individual case investigations, school dismissals, infection control, course of treatment, use of personal protective equipment, proper cleaning methods to prevent the spread of the virus, and risks associated with live vaccine use in immunocompromised populations. Between September 17, 2009 through ECC closing on March 30, 2010, the ECC received 14,300 calls; these calls were primarily on the H1N1 Vaccine System.

4. As of May 11, 2010, the CDC issued a total of 2,670,000 doses of 2009 H1N1 flu vaccine to New Jersey. Ninety-eight percent of the doses (2,604,801/2,670,799) were shipped to registered H1N1 vaccine provider sites (colleges and universities, community health centers, local and county health departments, government agencies and health care facilities that serve target populations such as the confined, hospitals, physician offices and employee health services, retail pharmacies). The remaining 65,199 doses were shipped by CDC directly to seven large New Jersey retail pharmacies.[9]

5. The NJDHSS public information campaign which focused on personal responsibility in preventing the spread of the flu (stay home if you are sick, eat right, exercise, get enough sleep) and good personal hygiene (wash hands frequently, cover coughs and sneezes, keep your hands away from your eyes, nose, and mouth) was very successful. Then-Commissioner Heather Howard was featured in two public service announcements in which she adeptly delivered public health messages in both the English and Spanish languages.

6. LINCS proved to be an efficient and effective means of communication for 2009 influenza A (H1N1) virus preparedness and response activities. Continuous and evolving messages, however, presented a dilemma to stakeholders, many of whom described being "overwhelmed" and "frustrated" by the volume of LINCS messages received.[10]

7. On a biweekly basis, NJDHSS Deputy Commissioner Dr. Susan Walsh, MD held conference calls with medical and public health professionals. The purpose of these calls was to provide a forum for questions and concerns on issues surrounding the H1N1 virus and H1N1 Vaccine System. Also discussed during these calls were Frequently Asked Questions (FAQs) written and revised by the CDS 33 times. The NJDHSS received very positive feedback from stakeholders on this outreach effort.

8. Between September 2009 and April 2010, the NJDHSS sponsored six summit meetings to provide direction on 2009 influenza A (H1N1) virus preparedness and response activities. Stakeholders were encouraged to attend the summits to receive up-to-date information, discuss problem areas, and provide input. The summits also provided stakeholders the opportunity to network and discuss

[9] The names of these pharmacies are available by contacting the CDS.

[10] Health Alert Network records indicate that 20 alerts, 10 advisories, 133 updates, and 43 information messages on the 2009 influenza A (H1N1) virus were transmitted via LINCS between April 2009 though March 2010.

issues of mutual concern and interest as well as build lasting relationships. Approximately 300 diverse stakeholders attended each of the six summit meetings. In addition, the NJDOE, in collaboration with the NJDHSS, hosted a New Jersey Educators Pandemic Summit on August 25, 2009. This summit was offered to assist schools with influenza A (H1N1) virus preparedness planning. Approximately 700 chief school administrators and public health officials attended the summit.

9. As of report publication, the anticipated third wave of 2009 influenza A (H1N1) virus activity has not occurred. A common concern voiced at the April 9, 2010 (and final) summit was what to do with unused vaccine.[11] Expired and/or unused vaccine is considered a regulated medical waste. On April 19, 2010, the CDS Vaccine Preventable Disease Program announced the Central Vaccine Recovery Program. The program, which is a federally managed initiative, was created to assist state and local health departments with the proper disposal of unused 2009 H1N1 flu vaccine.[12]

Primary Areas for Improvement

Several opportunities for improvement were identified throughout this real event. They are as follows.

1. Vaccine manufacturing for the 2009 H1N1 flu vaccine utilized embryonated (i.e., fertilized) hen's eggs. This conventional egg-based technology is slow and expensive. In New Jersey, the bulk of vaccine doses arrived after the second wave of the pandemic peaked on November 1, 2009. Moreover, availability of the 2009 H1N1 flu vaccine did not coincide with public information campaigns promoting vaccination. As such, a rapid mass prophylaxis response to the emerging pandemic was not possible. With the uncertainty of a third pandemic wave and the relatively mild severity of illness, interest in vaccination has waned significantly. According to H1N1 Vaccine System records as of May 11, 2010, 57% (1,510,000/2,670,000) of vaccine doses issued by the CDC to New Jersey are either unused, expired, or their administration not yet entered into the system.

2. There was reluctance among some medical providers to participate in the mass vaccination effort. This was particularly true among obstetrician-gynecologists and school nurses, contrary to 2009 H1N1 flu vaccine recommendations targeting pregnant women and school-aged children. Among school nurses, perceived liability issues,[13] school policy constraints, and lack of current experience with vaccine administration may have contributed to this reluctance.

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[11] Vaccine manufacturers have incorporated the H1N1 virus strain into the 2010/11 seasonal flu vaccine.

[12] The NJDHSS Vaccine Preventable Disease Program may be reached at (609) 826-4860.

[13] On June 15, 2009, the Secretary of the U.S. Department of Health and Human Services signed an amendment to the Public Readiness and Emergency Preparedness (PREP) Act based on the risk that the spread of the 2009 influenza A (H1N1) virus constitutes a public health emergency. This amendment provides targeted liability protections for H1N1 pandemic countermeasures. Countermeasures include the manufacture, testing, development, distribution, dispensing, and administration and usage of the 2009 H1N1 flu vaccines and any associated adjuvants. The immunity specified is only in effect with respect to present or future federal contracts, cooperative agreements, grants, interagency agreements, or memoranda of understanding.

3. Excluding the elderly among 2009 H1N1 high risk groups appears to have been a widespread public relations (albeit not medical) miscalculation. The elderly have long been recognized as a high risk population for seasonal influenza; the disparity in not being considered the same for H1N1 was neither sufficiently communicated by governmental and media outlets nor understood by the elderly and their family members and/or caretakers. This resulted in the perception of being "slighted" although the root of the matter was the initial limited availability of vaccine. More direct communication to senior citizen groups is recommended.

4. NJDHSS leadership described the pandemic influenza plan as, "woefully inadequate." The focus of the statewide plan was on avian influenza, more commonly referred to as "bird flu." Additionally, this plan assumed the next influenza pandemic would likely originate overseas. The plan is currently being revised from a strategy (roles and responsibilities) to operational (specific actions to be implemented) format. Conversely, the NJDHSS pandemic influenza plan was not limited to a particular virus strain. The plan also provided for pre-designated vaccine "ship-to" sites.[14] In other words, the CDC would ship vaccine doses directly to LINCS agencies in the event of a pandemic. When the influenza A (H1N1) virus emerged in early 2009, the CDC decided to allow all providers the opportunity of becoming registered ship-to sites. This was a significant departure from the existing plan as written and exercised.

5. With past incidents and emergency events involving mass prophylaxis, the HIPER Office of Emergency Planning provided SNS and/or Strategic State Stockpile (SSS) supplies to LINCS agencies; these agencies in turn "pushed" supplies from their RSS sites to municipal, county, and regional stakeholders (i.e., acute care hospitals, FQHCs). In response to the 2009 influenza A (H1N1) virus, SNS supplies were provided to LINCS agencies. However, these agencies were instructed to hold supplies until further notice; assets were "pushed" as deemed appropriate. Some supplies required proper cold storage (refrigerators, temperature logs, etc.). RSS sites maintained by LINCS agencies were not prepared to accept and store large volumes of supplies on a long term basis.

6. Stakeholders voiced a number of concerns with the H1N1 Vaccine System. This included lack of transparency (e.g., the logic behind registering some H1N1 vaccine provider sites while not others), ambiguous terminology ("hold" versus "cancelled"), inexplicit information as to the number of vaccine doses in multi-dose syringes, discrepancy in vaccine doses ordered versus supplied, distribution of ancillary vaccine supplies not always coinciding with the distribution of vaccine, inappropriate needle gauge size for pediatric patients, not knowing who to call if there was a problem, and lack of current, reliable demographic information on high risk populations along with the inability to track doses administered for these populations. Additionally, the H1N1 Vaccine System data base was limited with respect to the ability of generating reports useful in public health planning.

[14] A ship-to site is one approved to order and receive H1N1 flu vaccine from the CDC.

7. A number of stakeholders commented that there was a language barrier experienced by non-English speaking community members with respect to 2009 influenza A (H1N1) virus preparedness and response activities. No information was provided by stakeholders as to specific language(s) of concern.[15]

8. Although all LINCS agencies are responsible for coordinating emergency preparedness activities in their county, their inherent roles vary. Some LINCS agencies are responsible for both public and environmental health services for municipalities located within their jurisdictions. Others are only responsible for environmental health services. Remaining LINCS agencies provide a full range of services (both public and environmental health) to some but not all municipalities located within their jurisdictions. This lack of uniformity may have contributed to the impression among certain stakeholders of bias experienced during the 2009 influenza A (H1N1) virus real event. A full assessment is recommended to ensure uniformity of emergency preparedness coordination among LINCS agencies and municipalities.

9. Based on limited summit meeting participation by the Exercise Support Team and a review of survey reports completed by stakeholders, there was no clear indication that stakeholders implemented their existing plans, policies, and procedures in response to the 2009 influenza A (H1N1) virus real event. That is not to say they were not implemented, but rather their implementation was neither reported nor observed.

Conclusion

As of report publication, there were more than 3,000 cases of 2009 influenza A (H1N1) virus in New Jersey with 42 deaths. Notable past influenza pandemics include the 1918 Spanish Flu and the 1968 Hong Kong Flu which resulted in 50,000,000 and 1,000,000 worldwide deaths, respectively. The development of vaccines, anti-viral drugs, and antibiotics, along with improved sanitation, living conditions, and nutrition have all contributed to a marked increase in longevity amongst individuals living in the United States as compared with that of the turn of previous century.

In anticipation of a novel influenza virus, plans, policies, and procedures were developed as part of pandemic influenza preparedness and response activities. An assessment of these activities was made with strengths and gaps identified and presented in this report. An improvement plan with accountability for corrective action implementation will be available in the full AAR/IP.

[15] In addition to English, CDS health education staff developed and distributed 2009 influenza A (H1N1) virus educational materials in the Spanish, Polish, Chinese, and Arabic languages.

Lessons Learned

1. LINCS "information overload" concerns should be deliberated among LINCS users. Suggestions on ways to streamline, prioritize, and highlight new information provided in public health messages should be included among topics of deliberation.

2. Improved inter- and intra-departmental communications, expanded cross-training of staff, and ensuring both adequate and well maintained laboratory equipment will further improve the ability of the PHEL to respond to future incidents or emergency events.[16]

3. LINCS agencies must prepare for long term (>30 days) storage inclusive of proper cold storage and the ability to handle large supply volumes.

4. Standardized forms such as vaccine consent forms and child immunization record cards should be developed by the NJDHSS in languages specified by stakeholders. These forms should be downloadable for use by stakeholders as desired.

5. Given the enormous burden of seasonal influenza (medical expenses, lost potential earnings, lost productivity, death) and the important role school-aged children play in disease transmission (viral shedding begins prior to symptoms and may continue >10 days after symptoms appear with disease spread to household contacts, schoolmates, and community members), school nurses are encouraged to promote community awareness in pandemic preparedness. A concerted effort should be made to prepare school nurses for future emergency events requiring mass prophylaxis.

6. Pursuant to the federal Homeland Security Exercise and Evaluation Program (HSEEP), an AAR/IP helps communicate strengths as well as gaps observed during exercises and real events. The AAR/IP also provides accountability for corrective action implementation. HSEEP policy and guidance must be integral to exercises and real events from initial planning and design stages through AAR/IP preparation.

7. The time for relationship building is prior to an incident or emergency event. Sometime before the onset of the upcoming seasonal flu season, the NJDHSS should sponsor a workshop. Stakeholders such as the medical community at large (including obstetrician-gynecologists), school administrators, community leaders, faith based and special needs organizations, as well as the CDC and its contracted vaccine distributor McKesson Corporation should be invited to present and discuss vaccine plans, policies, and procedures. The role of MCCs and Hippocrates should also be clearly delineated at the workshop.

8. Stakeholders need to know who to call for answers when a problem arises. In addition, a system should be in place for conflict resolution (assigned mediator, panel comprised of both government officials and stakeholders). In this way, problems can be resolved or turned into opportunities.

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[16] Real Event: H1N1 Novel Influenza Public Health and Environmental Laboratories Response, April 25 - July 31, 2009, After Action Report/Improvement Plan. PHEL. December 2009.

9. Either a general guidance document or template for Just-In-Time vaccinator training should be developed by the NJDHSS and made available for use by stakeholders (particularly volunteer groups). New Jersey public employers with staff who administer vaccines must be in compliance with the Public Employees Occupational Safety and Health Bloodborne Pathogens Standard, 29 CFR 1910.1030.

Best Practices

1. The practice of confined industrial animal agriculture (commonly referred to as factory farming) must be abandoned. Overcrowded, unnatural living conditions make livestock and poultry prone to diseases, requiring large amounts of antibiotics and pesticides. This has resulted in antimicrobial resistance and new virus strains (including influenza) among humans. Other negative consequences include but are not limited to environmental contamination from agricultural runoff and poor worksite conditions. The nation as a whole must move towards natural, sustainable farming practices which rely on humane and ecological principles and practices.

2. Vaccine manufacturing technologies using hen's eggs are not well suited to pandemic response. New vaccine manufacturing technologies (e.g., cell-based) should be considered by the FDA.

3. An Incident Command System (ICS) must be established once an incident or emergency event unfolds. ICS is a standardized, on-scene, all-hazard incident management hierarchy used in responding to incidents or emergency events. With ICS, users adopt an integrated organizational structure so that individuals across multiple agencies can work together cooperatively and effectively without being hindered by jurisdictional boundaries. With the sanction of legitimate authorities, frequent training and exercises are held to sustain relationships, develop capabilities, and maintain proficiency.

4. Plans, policies, and procedures drive an agency's response to an incident or emergency event. Although it is recognized that incidents and emergency events are dynamic in nature and response actions must incorporate room for flexibility, there is often a willingness to deviate from plans, policies, and procedures even when such deviations are unjustified. This is a bad habit that needs to be broken. There is no point in exercising a plan, policy, or procedure when it will not be used during the time of a real event.

Appendix A
List of April 9, 2010 Pandemic Influenza Summit Attendees

County Offices of Emergency Management

Eskil Danielson, Sussex County OEM
Kevin Tuno, Burlington County OEM
Richard Colabelli, Essex County OEM

Education

Anthony Bland, New Jersey Dept of Education
Barbara Davis, New Jersey Institute of Technology (NJIT)
Deborah Bleisnick, New Jersey Department of Education
Emily Carey, Rutgers University
Jim Morris, Rutgers University
Robert Bumpus, NJ Dept of Education, Salem County
Thomas Coleman, Jr, New Jersey Dept of Education-Woodstown-Pilesgrove District

Federal Agency

Robert Blais, US Department of Human Services

Healthcare Partners

Amelia Ann Muccio, New Jersey Primary Care Association
Beth Myers, Chilton Memorial Hospital
Brendan McCluskey, UMDNJ
Brian Dolan, The University Hospital
Bridget Hogan, FQHC Central East
Carol Hudson, NJAPHNA
Carol Page, Ocean Medical Center
Cecelia Buggenhagen, Saint Barnabas Medical Center
Cheryl Esposito, Henry J. Austin Health Center
Concetta Polonsky, NJ SOPHE
Corrine Trembler, Warren Hospital
Darlene Rice, VNA of Central Jersey Community Health Center
Dave Weidner, Health Care Association of NJ
David Brooks, Jersey Shore University Medical Center
Diane Anderson, NJ Hospital Association
Dr. Rick Hong, Cooper University Hospital
Dr. Sharon Buttress, CAMcare
Ed Peloquin, NJAHEA
Elizabeth Murtha, Hunterdon Medical Center
Elizabeth Myers, Chilton Memorial Hospital
Ella Shaykevich, Union County Public Health Nursing
Gregory Nickel, East Orange General Hospital
Harsha Tripathi, Plainfield Health Center
Jamilah R. Davis, East Orange Primary Care Center
Jason DeLeonardo, MFHC
Joanne Wendolowski, NJAPHNA

Joseph Wood El, Southern Jersey Family Medical Center
Joy Spellman, NJAPHNA
Kamal Singh, Raritan Bay Medical Center
Karen Casey, CHEMED
Kelley Esposito, Community/Kimball Medical Centers
Loida Lebron, Ocean Health Initiatives
Mariannette Plaza, Palisades Medical Center
Marlene Fischer, South Jersey Healthcare
Mary Danish, Saint Michael's Medical Center
Michael Davie, Eric B. Chandler Health Center
Nancy Brouca, NJAPHNA
Nina Zimkas, NJAPHNA
Pat Weinstein, Zufall Health Center
Peter Brault, Paterson Community Health Center
Phyllis Worrell, Virtua
Rachel Bohs, AtlantiCare
Rich Morrow, Bergen Regional Medical Center
Rita Moore, Shore Memorial Hospital
Rosamond Lockwood, Newton Memorial Hospital
Sharon Alexander, Robert Wood Johnson University Hospital
Sheryl Brand, Home Care Association of NJ
Susan Lipyanka, Bayonne Medical Center
Terry Reiss, Valley Health
Timothy Gill, Saint Claires Health System
William McDougall, CANJHCS

Local and County Health Departments

Allen Lee, Ewing Township Health Department
Angela Musella, NW Bergen Regional Health Commission
Annmarie Ruiz, Cumberland/Salem Health Education Risk Communicator
Arlene Stoller, Morris County Health Education Risk Communicator
Carlo DiLizia, East Hanover Health Department
Carol Chamberlain, Lawrence Township Health Department
Carrie Nawrocki, Hudson Regional Health Commission
Cindie Belle, Morris County Office of Health Management
Christopher Chapman, Ringwood Health Department
Cindee DeGennaro, Jefferson Township Health Department
Cristianna Cooke-Gibbs, Washington Township Health Department
Colleen Hintz, Randolph Health Department
Daniel Levy, Township of Washington Local Health Agency
Daniel Regenye, Ocean County Health Department
Darlene O'Connell, Morristown Division of Health
Dave Henry, Princeton Regional Health Commission
David Richardson, Manalapan Township Health Department
Deborah Gash, Middlesex County Public Health Nursing
Dennis Green, Woodbridge Township Health & Human Services
Diane Trocchio, Rockaway Township Health Department
Donald Costanzo, Dover Health Department
Eileen Allen, Somerset County Health Department
Frank Wilpert, Mt. Olive Township Health Department
George Van Orden, Township of Hanover Health Department
George Sartorio, City of Vineland

Glen Belnay, Hillsborough Township Health Department
Hansel Asmar, Bergen County Department of Health Services
Helen Homeijer, Sussex County Public Health Nursing
Herbert Yardley, Sussex County Division of Health
Herbert Roeschke, Cumberland/Salem Department of Health
Holly Cucuzzella, Burlington County Health Department
Irene Jessie-Hunt, Passaic County Department of Health
James Cromley, Gloucester County Health Department
James Norgalis, Denville Division of Health
Jeffrey Plunket, Hamilton Township Division of Health
Jill Grady, Roxbury Health Department
Jill Swanson, West Windsor
John Christ, Hackensack Health Department
John Dowd, Monmouth County Public Health Department
John Ferraioli, Township of Union Health Department
John Festa, South Orange Health Department
John Hopper, Paramus Department of Health
John Horensky, Somerset County Department of Health
John Sarnas, Kearny Department of Health
John Surmay, Elizabeth Department of Health and Human Services
John Theese, Madison Boro Board of Health
John Wozniak, Montville Township Health Department
Judy Leone, Warren County Public Health Nursing
Karen Ring, Fort Lee Health Department
Kate Bond, Paterson
Kathleen Vito, Cumberland/Salem Public Health Nursing
Karen Comer, Harrison Health Department
Kevin Thomas, Cape May County Health Department
Kevin Sumner, Middle-Brook Regional Health Commission
La-Kisa Hines, Essex County Health Education Risk Communicator
Leslie Terjesen, Ocean County Health Education Risk Communicator
Lester Jones, Union County Department of Public Safety
Liliana Molina, Warren County Health Education Risk Communicator
Linda Duca, Atlantic County Health Department
Lisa Gulla, Edison Department of Health & Human Services
Lori Ann DiRienzo, Clifton Health Department
Louis Apa, Washington Twp Health Department
Lucy Forgione, Bernards Township Health Department
Lynette Medeiros, Hoboken Health Department
Marcia McGowan, Newark Department of Health & Human Services
Margaret Jahn, Freehold Health Department
Margaret Mantello, Bergen County Public Health Nursing
Marilynn Berstein, Bergen County Health Education Risk Communicator
Mark Culluccio, City of Plainfield Health Department
Maryann Orapello, Wayne Health Department
Megan Avallone, Westfield Regional Health Department
Monique Davis, Hudson County Health Education Risk Communicator
Michael Festa, Essex County Health Department
Michael Meddis, Monmouth County Division of Public Health
Nancy Gerrity, Camden County Public Health Nursing
Nancy Koblis, Linden Board of Health
Natalia Munoz, Union County Health Education Risk Communicator
Nelson Xavier Cruz, Englewood Health Department

Paschal Nwako, East Orange Health Department
Pasquale Pignatelli, Lincoln Park Health Department
Patricia Diamond, Atlantic City Division of Health
Peter Correale, Pequannock Township Health Department
Peter Leung, Bridgewater Township Health Department
Peter Summers, Warren County Health Department
Peter Tabbot, West Caldwell Health Department
Renee Glynn, Cape May County Public Health Nursing
Robert Gogats, Burlington County Health Department
Robert Ferraiuolo, Hudson Regional Health Commission
Robert Roe, Maplewood Health Department
Ronald Cash, Atlantic City Health Department
Robert Smith, Camden County Department of Health and Human Services
Rose Puele, Hunterdon County Health Department
Sam Yanovich, Mid-Bergen Regional Health Commission
Sandra Harris, Irvington Health Department
Sandra Van Sant, Monmouth County Regional Health Commission
Sherrie Wolpert, Middlesex County Public Health Department
Siobhan Spano, Hillsborough Health Department
Stephanie Carey, Montgomery Township Health Department
Stephen Papenberg, South Brunswick Health Department
Susan Portuese, Montclair Health Department
Suzanne Rose, East Windsor
Theresa DeNova, Township of West Orange
Theresa Hudak, Monmouth County Health Education Risk Communicator
Timothy Hilferty, Long Beach Island Health Department
Tina Rizzo, Burlington County
Tom Frank, Colts Neck Health Department
Tom Restaino, Essex Regional Health Commission
Tracy Storms, Sussex County Health Education Risk Communicator
Trevor Weigle, Paterson Division of Health
Vincent DeFilippo, City of Orange Township
Vincent Rivelli, West New York Health Department
Warren Hehl, Cranford Department of Health
Wayne Croughn, Parsippany Health Department
William Wallace, West Milford Township Health Department

Medical Reserve Corps

James Dockery, Bergen County
Maryanne Flately, Burlington County
Mary Gibson, Ocean County
Stephanie Mendelsohn, Mercer County

NJ Department of Health and Senior Services

Dr. Poonam Alaigh, Commissioner
Dr. Susan Walsh, Deputy Commissioner
David Gruber, Senior Assistant Commissioner
Joseph Tricarico, Assistant Commissioner
Allison Gibson
Andrew Snyder
Angela Sorrells-Washington

Anthony Kobylarz
Beth Jacob
Bruce Wolf
Carline Dixon
Cathy Vacirca
Daniel McFadden
Danielle Herring
Diana Garzio
Dr. Barbara Montana
Dr. Christina Tan
Drew Collot
Gary Ludwig
Geraldine Whitaker
Glenn Bukowski
James Bruncati
James Langenbach
Jeni Sudhakaran
Jennifer Martinez
Jennifer DeVenio
Jennifer Smith
Joseph Kolakowski
Julie Petix
Karen Fox
Kevin McNally
Lawrence Heidenberg
Lisa McHugh
Lois Yannick
Loxley Lambert
Meena Rathee
Michelle Malavet
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Rebecca McMillen
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Sally Flanagan
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NJ Office of Homeland Security and Preparedness

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Brad Mason
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Gerard McAleer
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Joseph Picciano
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Pharmacies

Erik Woehrmann, Walgreens
John Colaizzi, Walgreens
Scott Cariello, Save-On Pharmacy

Private Industry

Barry Prystowski, MD
Beverly Stern, NJ State School Nurse Association
Collen McKay, Consultant
Francis McCormick, Public Service Electric & Gas
Hope Bender, Holleran
Jerry Cevetallo, IAC Water Sector
Jocelyn Martin, Holleran
John Moyer, Disaster Preparedness Resources
John Saccenti, New Jersey Board of Health
Kevin Carr, Public Service Electric & Gas
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