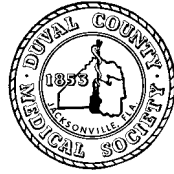


Mitigating the H1N1 Pandemic: A Year in Review



Background - Benefits that Matter!

The Duval County Medical Society (DCMS) attempts to provide its members with the benefits that consistently meet your professional needs. One example of how this is being accomplished is by providing to DCMS members free Continuing Medical Education (CME) opportunities in the subject areas mandated/and or suggested by the State of Florida Board of Medicine to obtain and retain medical licensure. The DCMS would like to thank the St. Vincent's Healthcare (SVHC) Committee on CME for reviewing and accrediting this activity in compliance with the Accreditation Council on Continuing Medical Education (ACCME). Helena Karnani, MD, Chair of the CME Committee; Betsy Miller, Director, Medical Staff, Quality Management; and Cindy Williamson, CME Coordinator, from SVHC deserve special recognition for their work on behalf of DCMS.

This issue of *Northeast Florida Medicine* includes an article, "Mitigating the H1N1 Pandemic: A Year in Review" authored by Taj Azarian, MPH and Saad Zaheer, MD, MSPH (*see pp. 17-22*), which has been approved for 1.0 AMA PRA Category 1 credit(s).™ For a full description of CME requirements for Florida physicians (MD/DO), please visit the DCMS website (http://www.dcmsonline.org/cme_requirements.aspx).

Faculty/Credentials: Taj Azarian, MPH, works as a Public Health Preparedness and Surveillance Epidemiologist for the Duval County Health Department located in Jacksonville, FL. Dr. Zaheer, MD, MSPH, is the Program Director, Epidemiology and Bioterrorism Surveillance for the Duval County Health Department

Objectives for CME Journal Article

1. Describe the public health response to the 2009 Influenza A (H1N1) Pandemic
2. Identify challenges and successes of the response
3. Generalize the morbidity and mortality of the pandemic and the efficacy of the vaccination campaign

Date of Release: September 3, 2010 Date Credit Expires: September 3, 2011 Estimated time to complete: 1 hr.

Methods of Physician Participation in the Learning Process

1. Read the "Mitigating the H1N1 Pandemic: A Year in Review: article on pages 17-22
2. Complete the Post Test and Evaluation on page 16
3. Cut out & fax the Post Test and Evaluation to DCMS (FAX) 904-353-5848 OR members go to www.dcmsonline.org & submit test online

CME Credit Eligibility

In order to receive full credit for this activity, a minimum passing grade of 70% must be achieved. Only one re-take opportunity will be granted if a passing score is not made on the first attempt. DCMS members and non-members have one year to submit the post test and earn CME credit. A certificate of credit/completion will be emailed, faxed or USPS mailed within 4-6 weeks of submission. If you have any questions, please contact the DCMS at 355-6561, ext. 103, or llegacy@dcmsonline.org.

Faculty Disclosure Information

Mr. Azarian and Dr. Zaheer report no significant relationships to disclose, financial or otherwise with any commercial supporter or product manufacturer associated with this activity.

Disclosure of Conflicts of Interest

St. Vincent's Healthcare (SVHC) requires speakers, faculty, CME Committee, and other individuals who are in a position to control the content of this educational activity to disclose any real or apparent conflict of interest they may have as related to the content of this activity. All identified conflicts of interest are thoroughly evaluated by SVHC for fair balance, scientific objectivity of studies mentioned in the presentation and educational materials used as basis for content, and appropriateness of patient care recommendations.

Joint Sponsorship Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of St. Vincent's Healthcare and the Duval County Medical Society. St. Vincent's Healthcare is accredited by the Florida Medical Association to provide continuing medical education for physicians.

The St. Vincent's Healthcare designates this educational activity for a maximum of 1.0 AMA PRA Category 1 credit(s).™ Physicians should only claim credit commensurate with the extend of their participation in the activity.

Mitigating the H1N1 Pandemic: A Year in Review

CME Questions & Answers (Circle Correct Answer)

Free-DCMS Members/\$50.00 charge non-members*

(Return by September 3, 2011 by FAX: 904-353-5848, by mail: 555 Bishopgate Lane, Jacksonville, FL 32204 OR online: www.dcmsonline.org)



1. What is the name of the Florida Department of Health's syndromic surveillance system?
 - a. NERVSS
 - b. ESSENCE
 - c. NVSN
 - d. ILInet
2. Which state was the first one to report cases of 2009 Influenza A (H1N1) in the United States?
 - a. Florida
 - b. California
 - c. Texas
 - d. New York
3. At what phase was the WHO Pandemic Alert Level when Florida identified its first case of H1N1?
 - a. Phase 3
 - b. Phase 4
 - c. Phase 5
 - d. Phase 6
4. In Florida, which age group demonstrated the highest rate of influenza hospitalizations due to H1N1?
 - a. 0-4 years of age
 - b. 13-18 years of age
 - c. 25-44 years of age
 - d. >65 years of age
5. Which previous pandemic replaced the then circulating H1N1 influenza virus with a H2N2 virus as the predominant seasonal strain?
 - a. 1957 Asian Flu Pandemic
 - b. 1968 Hong Kong Flu
 - c. 1975 Swine Flu
 - d. 1992 Flu season
6. In Florida, which age group demonstrated the highest rate of influenza hospitalizations due to H1N1?
 - a. 0-4 years of age
 - b. 25-44 years of age
 - c. 50-64 years of age
 - d. >65 years of age
7. Outside of the initial ACIP vaccination target groups, which group had the highest estimated vaccination coverage in Florida?
 - a. Children <6 months of age
 - b. Children aged 6 months-17 years of age
 - c. Adults 25-64 years of age
 - d. Elderly >65 years of age
8. Based on estimates from the BRFSS and NHFS surveys, how many persons in the U.S. were immunized for H1N1 by February 2010?
 - a. 36 million persons
 - b. 72 million persons
 - c. 86 million persons
 - d. 113 million persons

Evaluation questions & CME Credit Information

(Please evaluate this article. Circle one number using this scale: 1= Strongly Agree to 5= Strongly Disagree)

The article met the stated objectives: 1 2 3 4 5

The article was appropriate to my practice: 1 2 3 4 5

The topic was current and well presented: 1 2 3 4 5

Comments: _____

Name (Print) _____ Email _____

Address/City/State/Zip _____

Phone _____ Fax _____ DCMS Member (circle) YES NO

*Non-Member Charge (\$50.00) - See payment options below

Credit card: Visa MasterCard American Express Discover

Account # _____ Expiration date: _____

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Mitigating the H1N1 Pandemic: A Year in Review

Taj Azarian, MPH and Saad Zaheer, MD, MSPH

Editor's Note: Due to production constraints, Figure 2 is not printed in the journal. It is available online at www.dcmsonline.org as a web illustration.

Abstract: *In April of 2009, a novel influenza A (H1N1) virus was identified in the United States with the definitive characteristics of a pandemic virus. Within weeks, this virus had spread to every region in the country. In the preceding months, agencies spanning from the international to county and city levels responded to the rapidly expanding public health emergency. In Duval County, the healthcare and public health community united to mitigate the local effects of the pandemic. This response was marked by myriad challenges that were overcome by pre-event preparedness and planning. These successes were driven by a well developed infrastructure and relationships formed through detailed planning for public health emergencies. These strengths allowed us to address the increase of H1N1 cases in our community, subsequent deaths, and the mass vaccination campaign. Ultimately, the severity of this pandemic was lower than initially predicted; however, the number of hospitalizations and deaths were nonetheless considerable. This experience offers lessons which will facilitate the preparation of future influenza outbreaks and pandemic responses.*

Overview

The month of April, 2010 marked the one year anniversary of the emergence of a novel pandemic influenza virus within the United States. Despite numerous iterations of this virus' official title, the 2009 pandemic influenza A (H1N1) virus will be remembered as one of the most reported, documented, studied, and debated public health events in modern history. Now, over a year after the emergence of this virus, we reflect on the challenges and successes that occurred.

While vaccination campaigns and numerous studies of the 2009 influenza pandemic are still underway, many agencies are reflecting on the last year to evaluate how they responded. In the dwindling days of the pandemic, as predictions of a third wave of illness began to fade, members of the media were quick to pose the question to the public health (PH) and the medical community as a whole, "How did we respond?" For those that experienced the pandemic first hand; public health officials, health care professionals, and emergency responders, the response was in accordance with the event we had planned for since the 1918 Spanish flu left a devastating mark on mankind. However, as Colin Powell so concisely stated, "No battle plan survives contact with the enemy."¹

Throughout the course of the response, certain topics predominated. These included laboratory testing and surveillance methodologies, infection control recommendations, school closures, pandemic alert level designations, and of course, the vaccine and immunization campaign. As a result, significant

advancements have already been made in how these areas are addressed on a local, state, national and international scale, further strengthening future responses to PH emergencies. In addition, the scientific community's understanding of the epidemiology and pathology of influenza has greatly been improved. Subsequently, changes in the medical diagnosis and management of influenza patients have positively affected prognoses. Moving forward, we continue to examine these topics in finer detail and prepare for our next encounter with the enemy.

The Emergence of a Novel Virus

On April 17, 2009, officials at the Centers for Disease Control and Prevention (CDC) confirmed two cases of swine influenza in children living in neighboring counties in California.^{2,3} Over the subsequent week, reports of large, high mortality influenza-like illness (ILI) outbreaks in Mexico City fueled growing concerns that the two California cases were only the tip of the iceberg. On April 24, only one week after the initial CDC report, six additional cases in the United States were reported from three states; California, New York, and Texas. The following day, Dr. Margaret Chan, Director General of the World Health Organization (WHO), declared a "public health emergency" in response to the increase in cases reported by the United States and Mexico. Two days later, WHO raised the pandemic alert level to phase 4, signifying verified human-to-human spread of a novel virus. Subsequently, on April 29, as a result of increased human-to-human spread, WHO raised the pandemic alert level to phase 5. This move coincided with the first reported death in the United States and signaled a pandemic was imminent.

A State Responds

In the final days of April, 2009, as the number of states reporting confirmed cases of H1N1 began to grow, the Florida Department of Health (FDOH) prepared in anticipation for the identification of Florida's first confirmed case. Upon the identification of a novel influenza virus with pandemic capabilities, FDOH enacted response plans delineated in the Bureau of Epidemiology's Pandemic Influenza Annex. These plans called for implementation of enhanced surveillance and control measures identified in the rapid response and containment portion of this two-stage response. On April 27, 2009, Florida's acting state epidemiologist, Dr. Richard Hopkins, addressed the epidemiology staff of the state's 67 county health departments (CHD). This presentation provided an overview of the current situation and outlined the goals of the rapid response and containment portion of Florida's plan. The primary goal at this stage in the response: surveillance.

Two great strengths of FDOH prevailed during the emergence of this novel virus and throughout the pandemic

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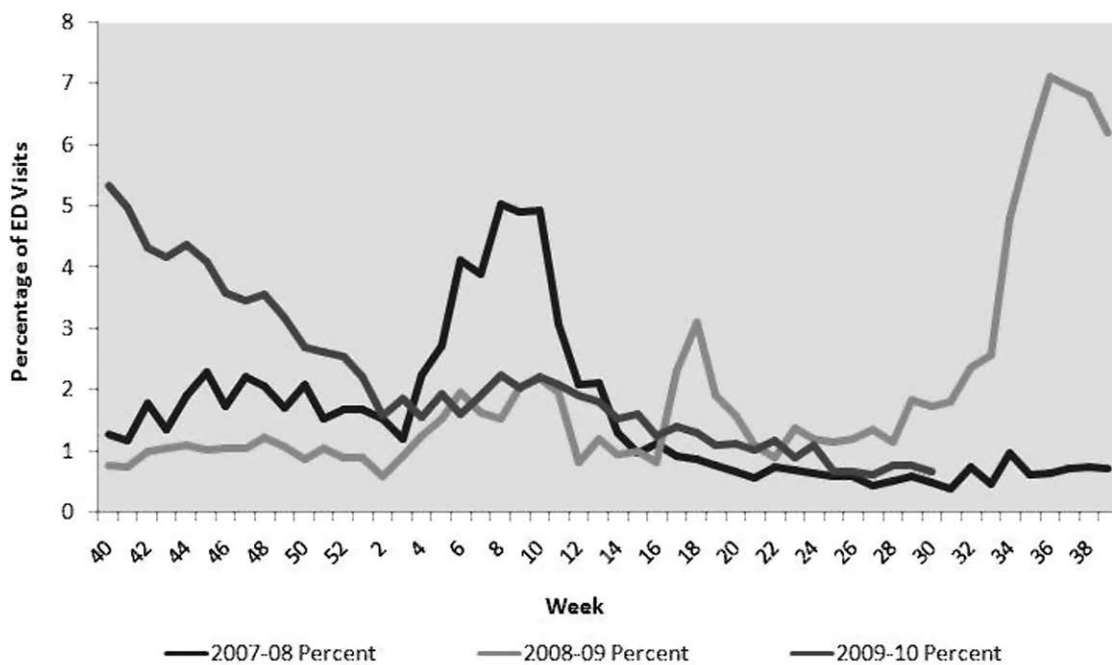
response. Primarily, FDOH has strived to continually expand PH surveillance capabilities. Electronic systems exist for the receipt of laboratory results from large private labs, as well as the state PH laboratories. These systems also allow for the electronic reporting of investigative case reports from the CHDs to the state. In addition, hospital emergency department (ED) syndromic surveillance (SS) data are monitored through the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE). Florida's ESSENCE SS system, which is implemented in 138 Florida hospitals, captures an estimated 75% of Florida's annual ED visits and allows for real-time population-level awareness of PH indicators. ESSENCE was used extensively during the H1N1 response to monitor levels of activity throughout the state. (Figure 1) These systems are flexible and efficient; two qualities which facilitate effective and timely responses to PH emergencies. Secondly, since the threats of Severe acute respiratory syndrome (SARS) and H5N1 Avian Influenza raised concerns among health officials, FDOH has been conducting training sessions to prepare staff how to respond. These trainings, often conducted in conjunction with collaborating state and national agencies, outlined response plans and forged interagency bonds. Ultimately, these two overarching strengths formed the infrastructure and laid the foundation for this response.

Combined with the earlier mentioned surveillance systems, the Florida Sentinel Influenza Surveillance Providers Network (ILInet) and the Florida Pneumonia and Influenza Mortality Surveillance System provide the basis for monitoring influenza

activity in Florida annually. CDC's ILInet is the cornerstone of national influenza surveillance. This program involves the recruitment of sentinel primary care providers throughout the United States which report the number of patients seen weekly with ILI during influenza season. In addition, specimens are collected from these patients and sent to a CDC or Laboratory Response Network (LRN) laboratory for testing and strain typing. This surveillance provides a composite view of national influenza activity and characterization of the circulating influenza viruses.

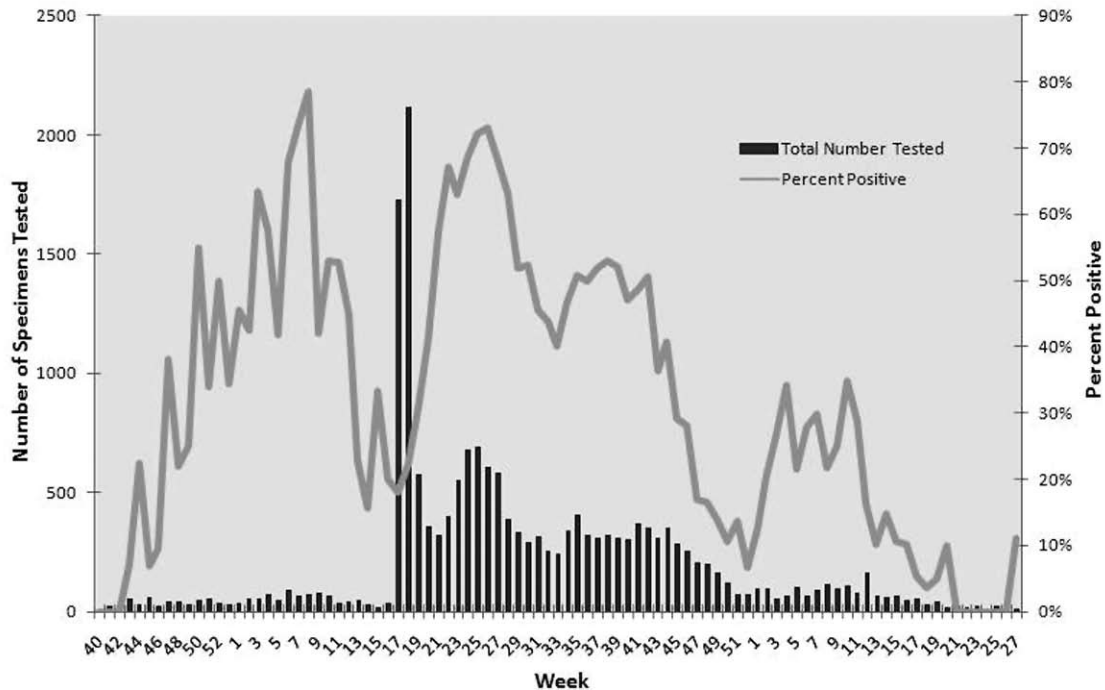
As FDOH ramped up surveillance in the early stages of the response, ILInet providers were requested to increase specimen collection. Health care providers were asked to evaluate patients with ILI and identify individuals with recent travel history to states or countries with documented cases. On May 1, 2009, FDOH Communications Office reported two CDC laboratory confirmed cases of H1N1 in Florida; an 11-year-old male elementary school student in Lee County and a 17-year-old female high school student in Broward County. On that day, pursuant to Florida Statutes, 381.00315, Governor Charlie Crist directed State Surgeon General Dr. Ana Viamonte Ros to declare a PH emergency that allowed the State Surgeon General to take any action necessary to protect the PH. At this point in the pandemic response, CDC had reported 109 confirmed cases of novel influenza in the United States, with one death in a twenty-three month old. Nationally, an estimated 298 schools were closed due to cases of H1N1, leaving the issue of school closures within Florida as a high priority topic. Within one

Figure 1 Influenza-like Illness Visits to ED



Visits (by Chief Complaint) to Emergency Departments (ED) as a Percentage of ALL ED Visits, Duval County ESSENCE Participating Hospitals (N=8), Week 40, 2006 through Week 24, 2010.

Figure 3 Number of Specimens Tested



Tested by Florida Bureau of Laboratories and Percent Positive for Influenza - Week 40, 2008 to Week 20, 2010.

day of this announcement, six other Florida counties were reporting cases of H1N1.

As the pandemic evolved, the PH surveillance and response objectives evolved as well. On June 11, 2009, Dr. Chan announced the decision to raise the pandemic alert level from phase 5 to 6; stating, “Spread in several countries can no longer be traced to clearly-defined chains of human-to-human transmission. Further spread is considered inevitable”.⁴ On that day, nearly 30,000 confirmed cases had been reported in 74 countries. This designation indicated a global pandemic was underway and marked the official transition from the rapid response and containment strategy to community mitigation. By the time the first cases of H1N1 were identified in Florida, the WHO pandemic alert was at phase 5. By May 1, Florida had already shifted to a community mitigation strategy.

A Local County’s Response

On April 27, 2009, the Duval County Health Department (DCHD) activated a joint incident command in conjunction with Jacksonville Fire and Rescue to respond to this rapidly expanding situation. The objectives were to coordinate the local response, maintain situational awareness, and plan for the identification of the county’s first case. Immediately, the need to provide rapid and accurate health information to healthcare professionals was identified. In response to this need, daily health and medical calls were established to update members of the healthcare community.

Duval County reported its first confirmed case of H1N1 in a 25-year-old female on May 6, 2009. This was Florida’s 55th confirmed case. In all, Duval County would report 67

confirmed hospitalizations due to H1N1, including 13 deaths (as of May 15, 2010). In addition, DCHD investigated over 25 ILI outbreaks in settings ranging from schools, daycares, shelters, military facilities, and family households. Case and outbreak investigations were also coupled with a tremendous demand for public information. Calls poured in from the community: healthcare providers reporting cases and requesting testing of patients, concerned citizens who had recently returned from Mexico, rumors of outbreaks, and inquiries from schools and businesses. All DCHD epidemiology and emergency preparedness staff were focused on the influenza response.

Cases

The identification, investigation, and reporting of H1N1 cases was one of the most dynamic aspects of the response. The initial objective was to identify, investigate and report each case of influenza. This key factor was imperative for characterizing the pandemic, estimating the severity, and ultimately determining the details of the PH response. Subsequently, an immediate and dramatic need for laboratory testing emerged. Patients began to present to EDs with ILI in growing frequencies, all requesting testing for H1N1. Local providers and urgent care centers were also greatly affected by a significant increase in visits and accompanying testing demands. Initially, CDC laboratories solely possessed the capability to provide confirmatory testing. In Florida, all requests were approved through the CHD prior to testing at the state PH laboratory and subsequent CDC confirmation. The four FDOH laboratories were quickly overwhelmed. CDC and FDOH issued clinician guidance for the testing

of suspect H1N1 patients and alleviated some of the demand for testing. The Florida Flu Hotline was also established to answer questions from clinicians and community members. Coinciding with the increase in testing requests, a tremendous demand for antivirals caused spot shortages throughout the state. On May 7, 2009, all FDOH laboratories were validated by CDC to provide confirmatory testing for the of H1N1 virus, and by mid-May most states had acquired this capability as well. During the peak of activity, these laboratories performed over 2200 influenza tests in a single week (*Figure 2, www.dcmsonline.org and Figure 3, p.19*).

In late May, CDC updated its testing guidance to place more emphasis on clinical outcomes and underlying conditions. Between the months of April to July of 2009, FDOH reported all laboratory confirmed cases of H1N1 to the CDC. From July on, FDOH, in accordance with updated CDC guidance, changed to reporting cases meeting select criteria: hospitalizations, including those in pregnant women, and deaths. An unintended result of the continual change in surveillance case definitions and case reporting was considerable confusion regarding the interpretation of these figures by the media and public. This fact also had an effect on the public's perception of the severity of the pandemic and the transparency of the PH response.

In all, Florida reported 1323 hospitalizations between July 28, 2009 and May 15, 2010, including 228 deaths. The highest rate of hospitalizations was observed in the 00-04 age group. The 50-64 year-old age group demonstrated the highest rate of deaths. Furthermore, of the total reported deaths, 84.2% had an identified underlying condition. It was identified early in the pandemic that this virus was sparing older individuals, contrary to what is traditionally

observed with seasonal influenza. It would later be identified that people born before 1957 were less susceptible to H1N1 than younger individuals. Why was 1957 the magic year? After its first appearance, the H1N1 virus which caused the 1918 pandemic dominated the circulating influenza strains for almost 40 years until it was replaced in 1957 by a H2N2 influenza virus which caused the Asian Flu Pandemic. While the pre-1957 H1N1 virus was significantly different than the 2009 virus, enough antigenic similarity existed to provide individuals exposed to the pre-1957 virus with protection against the 2009 virus.

From August 30, 2009, through March 27, 2010, WHO and National Respiratory and Enteric Virus Surveillance System collaborating laboratories in the United States tested 422,648 specimens. Of these, 89,585 (21.1%) were positive: 89,298 (99.7%) were positive for influenza A, and almost all were 2009 H1N1 viruses.⁵ During August 30, 2009-Mrch 27, 2010, 34 states reported a total of 41,689 hospitalizations associated with laboratory confirmed influenza virus infections to CDC.³ Rates of hospitalization were highest among children aged 0-4years. A total of 2,096 deaths associated with laboratory confirmed influenza virus infections were also reported to CDC during this period. Cumulative influenza-associated death rates since August 30, 2009, were highest among persons aged 50-64 years and lowest in children.³ Based on these data, and studies conducted by the CDC, estimates of morbidity and mortality were calculated for the time period of April 2009 through April 10, 2010.⁶ For this period CDC estimated between 43 million and 89 million cases of 2009 H1N1, between about 195,000 and 403,000 H1N1-related hospitalizations, and between about 8,870 and 18,300 2009 H1N1-related deaths.⁶ (*Figure 4*)

Figure 4 CDC Estimates of 2009 H1N1 Cases in the U.S. by Age Group

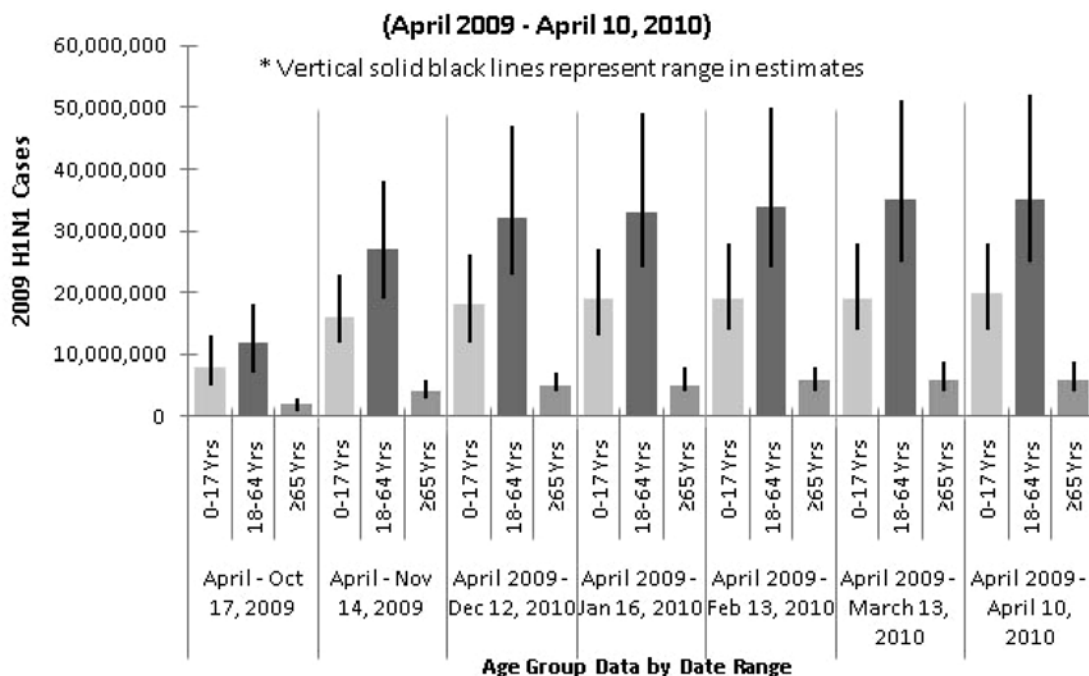


Table 1 Estimated Florida H1N1 Vaccination Percentages

	%	(95% CI)
Children/6 mos to 17 yrs	32.3	(±6.1)
Persons aged ≥18 yrs	16.1	(±2.1)
Person in initial target groups	28	(±4.1)
Persons aged 25–64 yrs at high risk	21.2	(±5.4)
Persons aged 25–64 yrs/ not initial target groups	11.2	(±3.1)
Persons aged ≥65 yrs	21.8	(±3.4)
Persons aged ≥6 mos	19.5	(±2.1)
Unweighted Sample Size = 9,442		

CDC estimated monovalent vaccination coverage among children and adults, Florida by selected age and priority subgroups - U.S., BRFSS and NHFS, end of January 2010.

The Vaccine

The most challenging component of the PH response was the vaccination campaign. Essentially, all mitigation efforts are conducted to slow the spread of the virus, providing more time for scientists to develop a vaccine. The quicker the vaccine is developed and administered, the greater reduction in the pandemic's morbidity and mortality. Upon identification of the influenza pandemic, several vaccine manufacturers began working on producing enough vaccine to meet the projected demand. It was evident that despite this massive effort to produce sufficient vaccine to rapidly immunize everyone; vaccine would more than likely become available to states in limited allocations. In July 2009, the Advisory Committee on Immunization Practices (ACIP) issued recommendations for the use of influenza A (H1N1) 2009 monovalent vaccine.⁷ These recommendations were intended to provide vaccination programs and providers with information to assist in planning and to alert providers and the public about target groups comprising an estimated 159 million persons who are recommended to be first to receive the vaccine.⁷ While the guiding principle of these recommendations was to vaccinate as many persons as possible and quickly as possible, state and local health officials were left as the final decision makers regarding how the vaccine would be administered and distributed.

Distribution of 2009 H1N1 vaccine in the United States began on October 5, using a system that allocated available vaccine to states proportional to their populations. On October 14, doses of vaccine began to arrive in small amounts to Duval County. Providers and healthcare facilities were required to order vaccines through a newly created module in Florida SHOTS, the state of Florida's immunization

H1N1 Pediatric Perspective

Haidee Custodio, MD, Fellow

Children and young adults were found particularly susceptible to the 2009 H1N1 influenza.¹ A wide spectrum of illness was seen with most children having mild disease and presenting mainly with fever, cough and rhinorrhea, and also vomiting and diarrhea.^{1,2} On the other end of the spectrum were critically ill children many of whom expired from the illness.^{3,4} The 2009 H1N1 influenza-associated pediatric deaths were twice as many as in the previous season.⁴

Children with chronic underlying medical conditions such as pulmonary disease, in particular asthma, were thought to be at higher risk for severe disease.^{1,2,3} Other risk factors included neurodevelopmental conditions, cardiovascular disorders, immunosuppression and obesity.

Management of patients included early antiviral use and antibiotics in cases of superimposed bacterial infections.^{1,2,3} With H1N1 vaccine availability since October 2009, it is hoped that the morbidity and mortality will be less among even the vulnerable populations.

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registry. CHDs could then allocate vaccine based on priority and availability. Several methods were utilized to distribute and administer vaccine. In addition to the distribution of vaccine through SHOTS, some CHDs conducted vaccine clinics modeled after points of distribution (PODs) used in mass prophylaxis campaigns. Others focused on school-based vaccinations. Duval County used a combination of PODs targeting first responders and priority distribution of vaccine through SHOTS to providers serving target groups. Vaccine was also made available at the DCHD Immunization Clinic. Vaccine administration tracking proved another surmountable task. While providers were required to register with SHOTS to order vaccine, they were not required to enter doses to administer. This made it difficult to determine geographic and demographic vaccine coverage. FDOH relied on tracking of vaccine doses distributed, partial entries of administered doses in SHOTS, and surveys of vaccine administration sites to estimate coverage.

On December 4, 2009, counties were authorized to expand provision of the H1N1 flu vaccinations beyond the five priority groups based on local availability of vaccine. Duval County expanded vaccination efforts in mid-December. At that point in the vaccination effort, Duval County had distributed 209,200 doses of H1N1 vaccine. At the end of January, 2010, CDC estimated vaccination coverage utilizing the Behavioral Risk Factor Surveillance System (BRFSS) and National 2009 H1N1 Flu Survey (NHFS). Approximately 61 million persons had been vaccinated by the end of 2009.⁸ By January 29, 2010, approximately 124 million doses had been distributed.⁸ At the end of February, based on data from BRFSS and NHFS combined, the estimated coverage rate was 24.0%, representing 72 million persons vaccinated.⁷ In comparison to the national data, *Table 1* shows Florida H1N1 vaccination percentages.⁹ (*Table 1, p. 21*) Four states in the New England region had estimated 2009 H1N1 vaccination coverage $\geq 60\%$. Of the four New England states achieving high coverage in children, three had conducted statewide school vaccination campaigns that coincided with a period of high demand for vaccine.

The Recovery

After every incident, there is a period of recovery; a time to rebuild, assess the lessons learned, and continue to plan for the next encounter with the enemy. During these encounters, strengths and weaknesses quickly become apparent. The investment this nation has made to strengthening preparedness and emergency response capabilities were immediately apparent. The infrastructure, response plans, and resources were available to respond to this incident. Within FDOH, surveillance systems, training, and staff demonstrated their ability to meet the demands of a large scale PH response. Among the local medical community, technology, surge capacity, and a dedication to care met the needs of the community. Agencies came together, realizing this was not just a PH response, it was a community response. Without cooperation between these partners, the pandemic could have taken a more severe course.

With these strengths, improvements have already been made in several other areas. This may have been the first PH incident where there was too much information for decision makers to process. Continually monitoring changes in

guidance became an arduous task of its own. As a result, the process for updating guidance, as well as the means of distributing it has greatly been improved. In addition, effective risk communication has always been a crucial component of any PH response. The 2009 H1N1 pandemic could not have emphasized this fact more. At times, this response was met with confusion, concern, and at some points, doubt by the public. The electronic age has revolutionized the means by which individuals obtain information. This, for PH, is a double edged sword. Facts and falsehoods are both easily discovered on the internet, and in that environment, it is often difficult to discern the two. Clear, transparent PH messaging at a national, state, and especially the local level during any emergency must be strengthened. Engaging faith based organizations and approaching schools proved successful in combating misinformation during the H1N1 response. These methods should be applied more broadly.

Summary

Overall, the 2009 H1N1 Pandemic brought PH officials from beyond the public's sight to the frontline of the response. As a result, people were reminded that we are not individuals isolated from one-another. We are all interconnected in a way which allows a virus to circle the globe in a matter of weeks. The ripple effect of this pandemic beyond influenza has subsequently further strengthened the way in which the nation responds to emergencies. Over the subsequent years, officials will continue to study the pandemic, preparing once again for the next encounter with a novel virus.

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Mitigating the H1N1 Pandemic: A Year in Review

Taj Azarian, MPH and Saad Zaheer, MD, MSPH

Figure 2. Number of Influenza-Positive Specimens Tested by the Florida Bureau of Laboratories by Subtype – Week 40, 2008 to Week 20, 2010

