Use of the Emergency Incident Command System for School-located Mass Influenza Vaccination Clinics

abstract

In Palm Beach County, Florida, the fall 2005 influenza vaccination season was interrupted by Hurricane Wilma, a particularly destructive storm that resulted in flooding, power outages, extensive property damage, and suspension of many routine community services. In its aftermath, all public health resources were immediately turned to the response and recovery process. School-located mass influenza vaccination (SLV) clinics were scheduled to begin in 1 week, but were necessarily postponed for a month. The juxtaposition of these 2 major public health events afforded the school district, health department, and other community services an opportunity to see their similarities and adopt the Incident Command System structure to manage the SLV clinics across West Palm Beach County, Florida, a geographically large county. Other lessons were learned during the hurricane concerning organizations and people, processes, and communications, and were applicable to school-located mass influenza vaccination programs, and vice versa. Those lessons are related here.

AUTHORS: Marsha Fishbane, MD, ScM, Anne Kist, RN, BSN, NCSN, and Richard A. Schieber, MD, MPH

Palm Beach County Health Department, West Palm Beach, Florida, and Epidemiology and Analysis Program Office, Office of Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention, Atlanta, Georgia

KEY WORDS
influenza vaccination, immunization programs, mass vaccination, school-aged population, school health services

ABBREVIATIONS
HCD—health care district
ICS—Incident Command System
PBC—Palm Beach County
SLV—school-located mass influenza vaccination

The 3 authors made substantive intellectual contributions to this published study and met the following criteria: (1) made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; (2) drafted the article or revising it critically for important intellectual content; and (3) approved its final version to be published.

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Address correspondence to Richard Schieber, MD, MPH, Epidemiology and Analysis Program Office, Office of Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), 1600 Clifton Rd NE, MS E35, Atlanta, GA 30333. E-mail: RSchieber@cdc.gov

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The period from September to December 2005 provided an unusual educational opportunity for public health planners in Palm Beach County, Florida (PBC), when a hurricane interrupted the influenza vaccination season. County health and school district officials had met during the last week of September to begin planning a school-located mass influenza vaccination (SLV) program for all elementary schools in the county, subject to approval by their principals. During October, school nurses had been trained to manage all elements of the program, and principals were making their final decision concerning possible participation of their school. The first schools were scheduled to begin vaccinating children November 1.

However, on October 24, Hurricane Wilma struck PBC and diverted all public health services to the management of this emergency. Hurricane Wilma was a Category 5 hurricane before landfall, the most intense hurricane recorded to date in the Atlantic basin. After the storm made landfall in an adjacent county as a Category 3 storm, its winds diminished but were still destructive as the storm moved through PBC. In its aftermath, schools were closed for 2 weeks; some were used as shelters, and others sustained serious storm damage or prolonged power outage. After a disaster, local governments are usually eager to reopen classrooms for education, in part because school reopenings are a visible sign that community life is returning to normal and to minimize the amount of curriculum time lost. Integrity of perishable vaccine was threatened by a lack of power. Personnel, especially American Red Cross nurses and health department staff, were redeployed to meet the disaster response needs.

The hurricane response completely disrupted the timeline and plans already made for the SLV clinics* and delayed their initiation for 4 weeks. PBC Health Department was involved in both events, thereby permitting real comparisons to be made between the 2 events. The Incident Command System used for hurricane rescue and recovery was adopted for the SLV program. We derived a set of lessons learned from the hurricane response that we could apply to the SLV program, and vice versa.

**PRESENTATION**

**Lesson 1: People and Institutions Need to Be Credible and Trusted**

In many cases, the same organizations and their personnel from public health, schools, emergency response, and volunteer groups participated in both the Hurricane Wilma response and the SLV program. Some organizations served a very similar role, whereas the roles of others differed (Table 1). In either case, it became clear from the hurricane response that a major requirement of these organizations was to be credible and trusted by the affected community. The reputation of such organizations relied on positive past experiences within the community during emergencies or new and unexpected community threats. We knew that in the public health management of natural, man-made, or terrorist disasters it was imperative to quickly identify the key professional people with success in past disaster management, as well as those with expertise in anticipating and managing the type of problems likely to arise from

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**TABLE 1** Comparison of the Roles and Responsibilities of Organizations and People Involved in PBC Disaster Response to Hurricane Wilma and the SLV Program

<table>
<thead>
<tr>
<th>Organization</th>
<th>Role in SLV</th>
<th>Role in Disaster Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palm Beach County Health Department (PBCHD)</td>
<td>Provided leadership and some nurse assistance to SLV clinics</td>
<td>Provided public health nurses in response to areas of need</td>
</tr>
<tr>
<td>School District of Palm Beach County (PBC)</td>
<td>Principal authorized participation; school staff disseminated information, collected consents, and supported clinic functions and student flow</td>
<td>Provided school facilities as shelters</td>
</tr>
<tr>
<td>Health Care District (HCD) of PBC</td>
<td>HCD nurses staffed SLV clinics; HCD pharmacists provided proper cold-chain storage of vaccine, repackaging of vaccine, and epinephrine for treatment of anaphylaxis</td>
<td>School nurses volunteered at safe-haven shelters; pharmacy provided staff and pharmaceuticals on-site for the special needs shelter</td>
</tr>
<tr>
<td>American Red Cross (ARC)</td>
<td>Although their participation was anticipated, the disaster response made it impossible for them to help staff SLV clinics</td>
<td>Provided coverage at school shelters and other facets of response</td>
</tr>
<tr>
<td>PBC Fire Rescue</td>
<td>Provided same-day delivery service of vaccine to each school clinic</td>
<td>Provided emergency medical care and fire suppression</td>
</tr>
<tr>
<td>Local pediatrician</td>
<td>Volunteered time to train school nurses and ARC nurses in advance</td>
<td>Volunteered in local medical reserve corps</td>
</tr>
<tr>
<td>Area hospitals</td>
<td>Provided incineration facilities to handle biomedical waste from the clinics</td>
<td>Provided emergency and other medical care</td>
</tr>
</tbody>
</table>

*Note that the use of the word “clinica” in this article refers only to SLV clinics, not to mass vaccination clinics after the hypothetical release of a bioterrorist weapon.
each type of disaster. However, experience and expertise are not sufficient to gain trust. These leaders need the community to respond with vigor to their direction, and that leadership role is only effective to the extent that leaders are trusted. The trust developed during both previous discussions and in past emergencies converted to trust of SLV programs and their clinics.

Lesson 2: School Facilities and Personnel Are a Very Broad and Deep Resource

Schools offer many of the necessary functions, personnel, and facilities also needed in the SLV program. Many have large gymnasiums that can be used as SLV clinic sites and are commonly preferred sites for managing or sheltering large numbers of people after disasters such as Hurricane Wilma. Schools are accustomed to providing services in addition to education, such as providing space for polling places, emergency shelters, meeting places for after-school activities, PTA meetings, and community fairs.

School personnel make excellent partners. Teachers, particularly at the elementary school level, are accustomed to managing the location of all their students at any given moment. Students look to them completely for guidance. School principals generally know what their facility, staff, and teachers are capable of doing on a day when a clinic is occurring. Office staff members are likely to know the parents, which helps in obtaining consent. Parent volunteers are already identified for each class and expect to help on such occasions.

In the days before the hurricane struck, school principals were making their final decision about whether their school would take part in the clinic program. As often occurs in a natural disaster, all schools were closed as soon as the hurricane struck, and many schools not severely affected by the hurricane were converted into temporary shelters. The principals needed to make a final decision whether to allow the clinic to take place. This was a difficult decision, given their priorities of returning to normalcy and catching up on missed lessons. The multiple sequential uses of school property indicated the depth of resources of the school system and its flexibility. It took several weeks after the storm for schools to clean up. Resuming school activities was a high priority for those managing the response, keeping the loss of curriculum time to a minimum.

Lesson 3: Keep the Plan Simple and Flexible

A disaster response is likely to be maximally successful if it is simple, flexible, easy to execute, and not too resource-intensive. This is likewise true of an SLV program. One method commonly used to reduce costs and achieve early program success is to piggyback it onto existing services or model it after an existing, successful system. The existence of multiple countywide services in PBC (including the school nurse program, fire rescue department, county pharmacy, and American Red Cross) made it easier to develop the SLV program in a piggyback manner. The plan was kept simple yet flexible by using the Incident Command System, discussed below. A successful disaster response that was developed through careful and detailed advance planning should not be modified when disaster strikes with the hope of generating a more perfect system. In that situation, such efforts are often counterproductive, because they often waste precious time and resources. An after-action review of a disaster response is conducted at the end of the disaster period to critique performance, policy, planning, and logistics. An after-action review of a school vaccination program will likely benefit from critiquing clinic performance after each day’s clinic ends, or the following day, to craft and engage interim changes.

Lesson 4: Adopt the Incident Command System to Help Plan and Manage the Program

The Incident Command System (ICS) is a standardized, on-scene, all-hazard incident management concept. The ICS is an integrated, predesigned organizational structure that can grow or shrink to match the degree of complexity and demands of an incident (eg, forest fire, hurricane, earthquake), without being hindered by jurisdictional boundaries. It can generate a more powerful response and operation because it enhances the effectiveness and efficiency of groups working together, thereby reducing the likelihood of errors, gaps, inadvertent miscommunication, or duplicated efforts occurring, while ensuring that a necessary aspect of the process has not been overlooked. The strength of the ICS arises from its clear reporting system, clear job definitions, accountability, and appropriate span of control by supervisors over a limited number of subordinates.

The PBC Health Department relies on the ICS to conduct disaster planning and response, both complex matters. It seemed reasonable to adapt this system to another complex situation, the seasonal influenza school vaccination clinics. There were several unexpected benefits. The most notable one was the ability to clearly identify which staff or volunteer person held each particular job before, during, and after the clinics, and based on job descriptions that were developed, what that job entailed (Fig 1, Table 2). Use of the ICS for the SLV program was a principal reason the components of the clinic program ran efficiently. It helped us gain buy-in from organizations and volunteers who were reluctant at first to participate. It did so by providing in
We consider it important for members of different groups and agencies to develop relationships with one another before any emergency or clinic. This can be a positive byproduct of disaster planning and disaster drills or school-located mass influenza vaccination programs. Better relationships help people perform their duties better because they more thoroughly understand the procedures, assets, and limitations of the other party. Trust built during disasters or disaster exercises can help during SLV clinics by teaching participants how to solve new, urgent problems together. For us, this was possible at the county level because many persons fill the same role in nonemergency vaccination clinics as they do in disaster response.

Lesson 6: Many Groups Need Specific Training

Training is needed on several fronts. Other than those involved in emergency preparedness and response, most public health workers, school officials, and volunteers have not used the ICS, and need such instruction. Training for SLV clinics can support county disaster preparedness because it retrains many school nurses about the use of proper and current vaccination techniques, roles, and responsibilities during a disaster.5

Well-prepared paid personnel and volunteers would benefit from advance participation in community interagency collaborations and attendance at one another’s training programs. For example, a school nurse could benefit by observing a public health nurse in an immunization administration clinic and learning health department protocols and priorities. Better preparation yields a quicker, more appropriate, and more flexible response. This level of hands-on commitment goes beyond acquainting oneself with another agency’s policies and assets by simply holding a meeting.

Figure 1

Use of Incident Command System for School-Located Mass Influenza Vaccination Program in Palm Beach County, Fall 2005.

Table 1

<table>
<thead>
<tr>
<th>Role</th>
<th>Agency</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Officer</td>
<td>Health Department</td>
<td>Public Information Officer</td>
</tr>
<tr>
<td></td>
<td>School District</td>
<td>Public Information Officer</td>
</tr>
<tr>
<td></td>
<td>Vaccine Manufacturer</td>
<td>Contra Affair Manager</td>
</tr>
<tr>
<td>Incident Commander</td>
<td>Health Department</td>
<td>Physician</td>
</tr>
<tr>
<td>Planning Section</td>
<td>Health Department</td>
<td>Nursing Supervisor</td>
</tr>
<tr>
<td></td>
<td>School District</td>
<td>Health Services Specialist</td>
</tr>
<tr>
<td></td>
<td>Technical Specialists</td>
<td>Vaccine Representative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private Sector Physician</td>
</tr>
<tr>
<td>Operations Section</td>
<td>Health Care District</td>
<td>Administrator</td>
</tr>
<tr>
<td></td>
<td>School District</td>
<td>Health Services Specialist</td>
</tr>
<tr>
<td></td>
<td>Nursing Group</td>
<td>Health Department - Admin.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Immunizations spec.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Volunteer School Nurses</td>
</tr>
<tr>
<td></td>
<td>School Site Coordinator</td>
<td>Health Services Specialist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Principal</td>
</tr>
<tr>
<td></td>
<td>School Site Support</td>
<td>Health Services Specialist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Volunteers, Parent/Teacher.</td>
</tr>
<tr>
<td>Logistics Section</td>
<td>Vaccine Storage Assembly</td>
<td>Health Care District - Pharmacy</td>
</tr>
<tr>
<td></td>
<td>Ground Support Unit</td>
<td>County Fire Rescue</td>
</tr>
<tr>
<td>Finance/Admin Section</td>
<td>Health Department</td>
<td>Assistant County Health Director</td>
</tr>
<tr>
<td></td>
<td>Procurement Unit</td>
<td>CFO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>School District - Risk Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>School Principals</td>
</tr>
</tbody>
</table>

Detail our expectations and the job boundaries, and allowing those hesitant to join us to estimate reliably, in advance, what their anticipated workload would be.

Lesson 5: Developing Partnerships With Other Agencies Involved in Disaster Preparation

PBC is a large county, covering >2500 square miles (larger than either Rhode Island or Delaware) and containing 1.2 million people, including the cities of West Palm Beach and Boca Raton. Organizations that routinely provide public services on a countywide basis, especially the Palm Beach County Fire Rescue and the School District of Palm Beach County, had their resources distributed and coordinated better across this entire county than the health department. Their services were already distributed countywide proportional to the direct and daily needs of the public.
or giving a lecture. However, this type of educational program requires vision and commitment from those at a high level to develop deep interagency familiarity and collaboration. Such a program is difficult to accomplish given the hectic schedule of public health workers today.

Lesson 7: Communication May Be More Important Than It First Appears

Good communication reassures people and helps them prepare for additional difficulties in the near future. Poor or inaccurate communication can spread erroneous information among the public that may be hard to disperse. Managing both disasters and SLV clinics requires a strong, well-conceived, and well-executed communication program that disseminates information from the lead agency to other public agency partners, parents, the school system, and the general public. This approach helps to improve understanding, acceptability, and even participation by staff, volunteers, parents, and older students. Good initial communication during the drill phase (for disaster planning) and the planning phase (for school clinic programs) helps team members work together better from the outset. For our SLV program, public information officers (PIOs) were provided from the health department, school district, health care district, and a vaccine manufacturer. All were helpful, and together they effectively functioned as a Joint Information Center of the ICS. For communications concerning these clinics, we recommend that each major county agency provide its public information officer or spokesperson, because he or she is keenly aware of what types of information and presentation are needed and effective in communicating with the local public.

Accurate and timely communication will help reduce panic and help the public better understand what they need to do to help take care of themselves and their families. PIOs use television and radio stations to disseminate knowledge and instructions in disaster response. For the clinic program, we used print media as well as a toll-free phone line that we provided to give the

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**TABLE 2** Division of Roles and Responsibilities Among the 3 Public Institutions Essential to the SLV Program in PBC, Fall 2005

<table>
<thead>
<tr>
<th>Organization</th>
<th>Roles and Responsibilities</th>
<th>Incident Command System (ICS) Chart</th>
</tr>
</thead>
</table>
| Palm Beach County Health Department (PBCHD) | • Oversight of SLV program  
• Oversight of financial contract  
• Provide guidance on any issues concerning safety (ie, vaccine storage, standing order for administration of epinephrine at school site by school nurse)  
• Assist in planning school outreach  
• Provide needed paperwork to school nurses and school site coordinators  
• Assist in providing nurses at individual school sites  
• Provide nurses to participating charter schools  
• Coordinate with all support agencies  
• Provide hotline for parents to call and ask questions with epidemiology  
• Coordinate media contacts | • Incident commander  
• Finance/administration  
• Planning  
• Operations  
• Liaison officer  
• Information officer |
| Health Care District (HCD) of Palm Beach County (PBC) | • Coordinate shipment of vaccine to HCD warehouse with MedImmune, Inc.  
• Purchase or rent freezer for storage of all vaccine, dry ice, and coolers for transport of vaccine to schools  
• Package immunizations for transport to schools in coordination with fire rescue  
• Provide needed supplies to the school nurse: epinephrine, coolers, ice packs, and vaccines  
• Create schedule for delivery and outreach in coordination with school sites  
• Coordinate vaccine administration activities at schools including reporting of data  
• Schedule nursing groups for assistance of vaccine administration at schools  
• Provide support for media | • Planning  
• Finance/procurement  
• Logistics/vaccine storage/assembly  
• Operations  
• Information officer |
| School District of PBC | • Communicate with SLV school site coordinators  
• Provide nonnursing support for all schools participating  
• Provide additional gloves, biohazard sharps containers, and biohazard waste bags to school sites; and plan for pickup of biohazard waste | • Information officer  
• Operations  
• Safety officer  
• Information officer |
public specific answers about the vaccine and the program.

**DISCUSSION**

SLV clinics bear many similarities to disaster response, such as rapid distribution of goods and services to a great number of people in a short time. Accordingly, sharing information and lessons learned from these 2 types of events can benefit future planning for each. Given some forethought, SLV clinics could be used as tests of disaster planning performance. Our use of the ICS gave agencies valuable experience in its application and hence enhanced the effectiveness of the SLV program. A well-conceived and well-executed mass school vaccination program can empower its participants and their organizations and contribute to preparedness efforts.

**ACKNOWLEDGMENTS**

We thank MedImmune, Inc. (Gaithersburg, MD) for providing all vaccine and much of the supplies used as part of their 2005 FluMist for Schools Program. Their staff also helped conduct technical training in vaccine storage and administration. From the Health Care District of Palm Beach, Anne Hedges, RN, MSN, School Health Administrator, Ginny Keller, RN, MBA, Assistant School Health Administrator, and Jose Rodriguez, RPh, MBA, Director of Pharmacy, provided health and pharmaceutical services. We thank Lashranda Span, MS, PT, Health Services Specialist, and other members of the School District of Palm Beach County for their key role in coordinating the efforts of various groups, recruiting schools to participate, preparing and disseminating information, and providing clinic space. Tommy Schechtman, MD, helped train school nurses and served as a program spokesperson to the media. Kevin Applegate, Captain, Palm Beach County Fire Rescue, coordinated their countywide deployment of vaccine to all participating schools. Boca Raton Community Hospital managed the disposal of biomedical waste.

**REFERENCES**

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