The Monroe County Department of Public Health (MCDPH), in partnership with the Monroe County Medical Society (MCMS), developed a vaccine redistribution model to address the shortage of influenza vaccine during 2004–2005 by assessing the community’s need among high-risk patients and establishing a system of redistribution. The target population was high-risk groups defined by the Advisory Committee on Immunization Practices. The main goals were to ensure that only high-risk individuals be vaccinated, to allay public concern, and to eliminate the difficulties associated with public clinics. The MCDPH requested the cancellation of all public and employer clinics, and that vaccine be redirected to physicians who could best determine a patient’s need. In addition, the MCDPH asked that private physicians who had excess vaccine make it available. Within 12 weeks, the MCDPH, working in partnership with the MCMS, had redistributed 60,000 doses of influenza vaccine and vaccinated all high-risk patients identified.

KEY WORDS: influenza vaccination, public health and medicine, public health emergency, redistribution

Collaboration between public health and private providers has proven to be successful and efficient in many areas of healthcare. The 1997 monograph, Medicine & Public Health, is based on 414 case studies of public and private health initiatives that improve access to care, quality and cost-effectiveness, and address community health problems. These collaborations include programs designed to increase primary care Medicaid coverage for children, to conduct health education campaigns, and to provide physician informational resources. For example, in the late 1980s, the Monroe County Department of Public Health (MCDPH) participated in a community-based program to test the cost-effectiveness of Medicare coverage for influenza vaccine. The MCDPH worked with physician practices to increase influenza immunization rates from 45 percent to 75 percent of the Medicare population, and decreased hospitalization rates and nursing home outbreaks.

Although there have been many descriptions of medicine and public health collaborations related to improving care, increasing access, and promoting preventive health services, there is little literature describing public health and medicine collaborations in response to public health emergencies. A study of the 2001 anthrax attacks highlighted the need for better integration between the public and private healthcare systems during public health emergencies. For example, advice from private physicians was one of the most critical factors in patients’ adherence to anthrax prophylaxis. It is important to equip physicians and other providers to play key roles during public health crises.

The recent influenza vaccine shortage can be viewed as a public health emergency. Influenza is a leading cause of death, with 36,000 deaths and more than 200,000 hospitalizations each year in the United States. For the past 5 years, influenza vaccine supply and distribution has been disrupted. Priority guidelines have been issued, but there have been difficulties managing the vaccine supply and reaching subgroups of the high-priority populations. Many localities have had to
Influenza vaccination, and recommended vaccination by the Advisory Committee on Immunization Practices (ACIP) issued guidelines regarding priority groups for influenza vaccination, and recommended vaccination of high-risk patients only. This reduction in available trivalent inactivated vaccine resulted in a tremendous challenge for federal, state, and local health officials, and most important, for providers of medical care at all levels. Many public health agencies approached the shortage as a public health emergency.

As the United States readies itself for an influenza pandemic, establishing relationships and processes within communities, and specifically with private providers, will be critical to establishing working response plans. In Monroe County, the response to a biological event necessitating vaccination of the population, such as pandemic influenza, would require 4,000 volunteers to operate our “point of dispensing” clinics. Using private providers to cover some or all of their own patients and determine prioritization, as they know their patients best, could alleviate some of the burden on public health. Providers can also assist in public education, rumor control, and adherence to protective guidelines.

The following model for vaccine redistribution, implemented during the 2004–2005 influenza season, is based on public health-private provider collaboration. Vaccine was limited to high-risk patients, but defining these patients is often difficult in a public setting. Providers are better able to triage vaccine among their patients. In addition, many high-risk patients are unable to attend public clinics or wait in long queues. On the other hand, some patients do not have or cannot access a primary care physician for their influenza vaccine. A combination of public health coordination and primary care practice vaccination assures the best distribution of vaccine in short supply.

**Implementation**

On the day of the announcement from Chiron, the MCDPH requested that public influenza clinic providers voluntarily stop public clinics until the local vaccine situation could be assessed and information from the CDC interpreted. The MCDPH and the MCMS immediately began surveying the medical community including all area nursing homes and other long-term-care facilities, home care agencies, local physicians, private nursing agencies, and public influenza clinic providers. The MCMS compiled information to determine the vaccine deficit based on high-risk need, as well as how much vaccine was available in the community. Within 1 week, more than 150 physicians or practices responded to the survey, identifying an initial need of more than 56,000 doses for high-risk individuals in the community and 7,000 doses for nursing homes. The total deficit within Monroe County later rose to 80,000 doses.

This deficit resulted in the decision to restrict vaccine use to high-risk individuals only, and to cancel all public clinics for the remainder of the season. Screening for
priority groups can be difficult in a public clinic setting because of patient limitations and the reluctance on the part of community vaccinators to implement screening algorithms and turn patients away. The local public clinic providers (nursing agencies) were concerned about adverse financial effects, but agreed to cooperate. The health departments of surrounding counties also elected to limit public clinics.

To minimize potential financial losses, the MCDPH assisted the nursing agencies to redirect and administer vaccine in the long-term-care facilities and nursing homes. This was accomplished through providing contact information and requirements of the facility to the nursing agencies for direct contact and arrangements. All nursing homes and their associated living centers in need of vaccine were covered (approximately 30 facilities and 7,000 doses). Vaccine was included for residents and patient care staff. The nursing agencies also assisted community organizations serving special populations, such as the Rochester Psychiatric Center and ARC of Monroe (serving those with developmental disabilities). This plan enabled the agencies to use their vaccine and obtain revenue. The MCDPH and the MCMS also redistributed vaccine to other high-risk populations including HIV clinics, dialysis units, and cancer centers, and by the end of October had covered the community’s highest risk patients, before any nationally redistributed supply arrived.

The MCDPH and the MCMS identified potential sources of excess vaccine within the provider community, and coordinated the process of provider-to-provider exchange. For example, pediatricians, who had met their high-risk patient needs, shared their vaccine with adult practitioners who had no vaccine. Vaccine was transferred per NYSDOH guidelines, including transportation safeguards and vaccine lot tracking. By early November, 28 percent of our private physician needs had been covered.

Later that month, the state and federal vaccine distributed to our community was sold or given directly to small physician practices for administration in their offices. For large practices, coordinated invitation-only clinics were conducted by the nursing agencies. Physicians identified their high-risk patients and alerted them to the date, time, and location of a private clinic through a letter that the MCDPH crafted.

Much of the redistribution plan relied on getting vaccine to people through the physician. However, it became apparent that a small segment (approximately 20%) of the high-risk population would be missed with strict adherence to this model. Therefore, the MCDPH also redistributed vaccine to community agencies that serve the homeless, uninsured, and those without medical providers. In addition, the MCDPH held several unpublicized, appointment-only sessions for people who had been determined to be high risk but were not able to get vaccinated through a physician. Health department staff screened individuals and scheduled their appointments. This was an effective way of vaccinating those who would not get vaccinated otherwise. The health department staff also referred patients to the MCMS to establish a primary care provider for the future. As more vaccine became available and the CDC criteria expanded, we continued to encourage vaccination to the public.

Below is an outline of the key events of the redistribution efforts:

**Week 1: Assessment**
- Survey the community to determine deficit based on high-risk need.
- Cancel all public and workplace clinics.
- Conduct regional conference call with local health departments.

**Weeks 2 to 5: Initial redistribution**
- Redirect nursing agencies to long-term-care facilities and nursing homes.
- Redirect vaccine to HIV clinics, dialysis units, and cancer centers.
- Identify sources of excess vaccine; coordinate provider-to-provider exchange of vaccine.

**Weeks 6 to 12: Continued assessment and redistribution**
- Distribute state and federal vaccine to small physician practices.
- Coordinate invitation-only clinics conducted by nursing agencies for large practices.
- Redistribute vaccine to agencies that serve the homeless, uninsured, and those without medical providers.
- Conduct appointment-only sessions at the MCDPH.

The MCDPH and the MCMS conducted ongoing assessment of need and communication with local providers and the public throughout the shortage period. In addition, the MCMS tracked the total number of redistributed doses and kept logs of those practices and facilities that received the doses. By the end of December, 60,000 doses of influenza vaccine had been redistributed, and all providers reported that all high-risk patients had been vaccinated. More than 160 physicians and health-related organizations participated in the efforts. (It is important to note that the Rochester area includes about 1,000 medical practices, and that only 160 had vaccine available for redistribution. Most practices were in need of vaccine.)
<ul><li><strong>Results</strong></li></ul>

Evaluation of the redistribution process included surveys and qualitative feedback from the healthcare agencies and physician community. The MCMS received numerous thank you letters from patients and providers. For example, one patient wrote, “Thank you for supplying the flu shots... I’m 85 years old and had been worried that I would not have any...” A physician stated, “I just wanted to take this opportunity to thank you for the incredible job you and your staff did with the recent influenza vaccination shortage... I cannot thank you enough from my partners and my patients.”

A survey of randomly selected Medicare recipients in Monroe County (400 white and 400 African American Medicare recipients with listed telephone numbers) was conducted in the spring of 2005. On the basis of self-report on the survey, 83 percent of white and 69 percent of African American seniors received influenza vaccine during the 2004–2005 vaccination season. This compares very favorably with the 2004–2005 national influenza immunization rate of 67.8 percent for all adults aged 64 and older, determined by the Behavioral Risk Factor Surveillance System.7

This model had two key components: (1) an established and ongoing relationship between public health and our community partners and (2) attention to the nursing agencies’ needs and efforts to include them in the redistribution activities. While it may not be applicable to every jurisdiction, it highlights the importance of community cooperation during public health emergencies.

<ul><li><strong>Evaluation</strong></li></ul>

**Challenges**

This model is a planned response to an emergency situation, but execution comes at a price. A small public health immunization staff struggled to design and implement a system to assure the distribution of vaccine to those at highest risk. The biggest cost was staff time for both the MCDPH and the MCMS, as several senior staff spent approximately 12 weeks implementing the program, and others dedicated a substantial amount of time and effort as well. At both the organizations, nonemergent activities were delayed until the distribution effort was complete.

The licensed nursing agencies incurred costs as a decrease in expected revenue for the season. They typically provide 60,000 vaccines to the community each year, and reimbursement for administration constitutes a substantial portion of their revenue. Arranging for them to cover the nursing homes and other high-risk facilities, and conduct the private clinics, minimized their loss on their estimated 39,000 doses. The invitation-only clinics were time consuming for the physician offices and somewhat confusing for the patients, but were helpful in minimizing the revenue loss for the community vaccinators. The health department also fell short of the expected revenue target for the influenza vaccine.

Other challenges included:

- Identifying and estimating the number of high-risk patients in each practice and in the community as a whole.
- Identifying vaccine supplies in the community. This is proprietary information that is shared voluntarily, but not all partners were forthcoming with their information.
- Implementing a local plan in conjunction with the state and federal plans.
- Having little leverage to force organizations to follow established guidelines.
- Assisting people in the community who do not have physicians or have primary care physicians who do not provide vaccinations.

**Lessons learned**

Initially, local health units (LHUs) will have to rely on their staff and their community to respond quickly in the event of a mass public health emergency. Difficult decisions about the distribution of scarce resources may have to be made initially by the LHUs, without guidance from the state or the CDC. Several important issues came to light during the redistribution process that will aid in our preparedness planning:

- **Effective community partnerships are invaluable.** For example, the MCMS provided access to its physician database (compiled through membership and collaboration with other local agencies), communication system, and resources. The MCMS worked side by side with us to survey the community in order to identify vaccine surplus and deficit. The MCMS informed the public and medical community, assisted with physical collection and redistribution of the vaccine, and provided coordination for private physicians. Throughout this effort, the MCMS spent a great deal of time conducting one-on-one conversations with physicians.
- **It is critical to understand the concerns of all partners.** Not all community partners share the same goal, so performance expectations must be stated clearly and frequently. To develop shared trust, agencies must understand the motivations and challenges of their partners, such as the nursing agencies’ reliance...
on revenue from annual administration of influenza vaccine.

- **Communication strategies must be effective.** Our Web site, information lines, faxes, e-mails to the medical community, and media communications were all used extensively. The media helped to spread the message of the reasons behind our decisions, and reinforced the CDC guidelines to the community.
- **A complete and up-to-date physician database and communication system is critical.** In addition to the MCMS database, the MCDPH keeps an e-mail database of individual physician, both generalists and specialists. However, a practice database versus an individual physician database may be more efficient and effective during emergencies.

● **Conclusion**

This model is designed to assess need and redistribution of vaccine to assure coverage of the most vulnerable members of the community. It is intended for a crisis response to ensure the high-risk needs are covered, allay public concern or panic, and eliminate the difficulties associated with public clinics at times of crisis. As a result of this experience, the MCDPH will examine ways to be more prepared, develop standard protocols, and implement changes to ensure wider vaccine coverage. For instance, these goals might be accomplished through assisting the medical community with vaccine ordering decisions, preidentifying high-risk patients, promoting vaccination in physician offices, and improving provider communication systems. The Monroe County Adult Immunization Coalition is also examining large group vaccine purchase models.

The vaccine redistribution process outlined above does not address the root causes of vaccine supply shortages and delays. Production and delivery problems need to be quantified and addressed. Incentives must be created to encourage multiple manufacturers to produce an adequate supply of influenza vaccine. Until such a time, the MCDPH and community partners will continue to work collaboratively to ensure that vulnerable individuals in our community receive the benefit of influenza vaccine.

**REFERENCES**