
abstract

A school-located mass vaccination clinic approach can enable rapid vaccination of a large number of students while minimizing disruption of their school activities and potentially reducing missed work hours by parents. During 3 consecutive influenza seasons beginning in 2005, the Knox County Health Department conducted school-located mass vaccination clinics using live attenuated influenza vaccine. Clinics were held each year throughout the county over 4 weeks in more than 100 public and private schools for more than 65 000 students in Grades K to 12. Overall, the proportion of all students vaccinated at school each year exceeded 40%. Our experience indicated that careful and thorough planning was essential to program success. Critical planning elements included (1) initial planning with extensive lead time to find the proper lead agency and project leader and to develop sound comprehensive vaccine clinic planning; (2) developing partnerships, especially with schools; (3) communicating successfully with parents, children, school administrators and teachers, medical providers, and the community at large; and (4) educating these groups successfully, using good timing, through local media, school events, direct mailings (including parents receiving information and consent packets), and partners. We review here the details of these key planning elements.
School-located mass influenza vaccination (SLV) clinics are designed to vaccinate a large proportion of schoolchildren. This is an effort to reduce the incidence of childhood morbidity and mortality caused by influenza while working to achieve community herd immunity to protect those not vaccinated. For 3 years, from 2005 through 2007, the Knox County (TN) Health Department (KCHD) held such clinics in more than 100 public and private schools throughout the county for ~65,000 students enrolled in grades K through 12. By using the school as the unit of analysis, the mean all-school vaccination rate among public and private schools was 45% in 2005, 48% in 2006, and 42% in 2007. Among public elementary schools, the mean school-based vaccination rate was 57%; among middle schools, 42%; and among high schools, 25%. Among private schools, the vaccination rate for all grades K through 12 was 61% in 2006 and 52% in 2007. These findings are documented elsewhere.\(^1\)

Based on our experience, we suggest some methods that appear promising in increasing vaccination rates among schoolchildren. In managing the program each year, we repeatedly reviewed clinic and program performance to determine aspects that did not work as well as what was needed. We gathered input from multiple sources beginning fall 2005 using end-of-project after action reviews by public health vaccination team leaders; surveys from principals and school faculty; written and verbal comments from parents and key stakeholders; conversations and meetings with school staff, volunteers, and contract staff; and e-mail and Web comments from parents and key stakeholders. Such information helped us examine the actual processes being used, and determine changes needed. These suggested changes were disseminated across the system and implemented quickly, generally at the next clinic that was held. At the end of each season, we sought more extensive input from key stakeholders, examined our processes, and made additional appropriate changes.

We describe those promising strategies we developed in the realms of planning, partnership development, communication, education, and sustainability. In a separate article, we give a detailed description of the aspects of clinic logistics and performance.\(^2\)

**INITIAL PLANNING**

**Advance Preparation Was Vital To Our Program Success**

We found that extensive lead time was quite helpful, and recommend that it begin, when possible, the January or February before the next influenza season begins. The longer advance period enabled us to include more key stakeholders in the decision-making process, notify local providers of our intentions, and preorder sufficient vaccine. The initial planning stage is composed of 4 key areas described in the following sections.

**Selecting the Lead Agency (Organization) and the Project Leader Early**

KCHD took the initiative to lead this program. Although the project lead person may be an employee of any agency, it facilitates planning if the leader is a member of the lead agency. One high priority is the early recruitment of core team members and development of a project plan. Initial recruitment should focus on finding stakeholders from agencies or organizations that have strong resources (personnel, funding, or clinic sites) as well as those who can help obtain additional resources (eg, school administrators, superintendents, school nurses, and health department personnel). Preferably, members should have direct decision-making authority for their organization to avoid delays and their attendant frustration. In the United States, the local health department is commonly the lead agency because it already has the experience, resources, and emergency response role in the community.\(^3\) Indeed, some large local health departments are well organized and have the capacity, expertise, and funds to conduct the project in its entirety without supplemental help.

**Project Funding**

Project funding is based especially on the projected need for vaccine, its delivery model (intramuscular versus intranasal), staffing model, and printing costs of educational and consent material. Because most granting organizations require a long lead time for consideration, it is important to know their timelines for awarding grants.

**Vaccine Planning and Ordering**

Planning and ordering the vaccine is probably the most critical piece of the initial planning process. The current ordering system for influenza vaccine in the United States calls for “preordering” requests to be submitted to manufacturers in late January or early February, well in advance of vaccine administration the following fall and winter. The scope and size of the project determine the number of doses needed, and should be decided early. Good coordination is needed with state immunization programs to determine the number of doses that can be supplied from their projected stores, including especially the vaccine doses purchased with the Vaccines for Children (VFC) Program or Section 317 funds.

**Establishing a Tentative School-by-School Clinic Schedule**

Establishing a clinic schedule for all schools in the program should be done as early as possible. Each school sets its
own academic schedule, so each school should be considered in advance, class by class, lest 1 or more classrooms would be absent from school that day because of a field trip or unavailable because of testing.

**PARTNERSHIP DEVELOPMENT**

At this time, most local health departments do not have the capacity to internally fund and support an entire SLV clinic program. They therefore rely on partnerships with the private sector and with other organizations to succeed. For this reason, partnerships are essential (see the following details). In addition to serving as a potential funding or staffing source, partners can also provide other necessary resources, including refrigerators, entrance to the school system, and introduction to other valuable potential partners. One should consider partnerships at all levels of jurisdiction: local, state, and national organizations. Developing multiyear partnerships should be especially encouraged, because they will help sustain a program over several years.

The local school system is the single most important partner for several reasons. The students are already present; school administrators control the space where the clinic will be held; and the principal, staff, and teachers have a significant influence on students and parents, which can have an effect on vaccination rates. School system personnel can help in planning, communications, staffing, conducting the clinics, and, in some cases, data analysis. Office staff and school nurses can help contact nonresponding parents, answer their questions about the program, and obtain parental consent. This is a vital and unique role of school staff. Under the federal Family Educational Rights and Privacy Act, school employees cannot legally divulge information (except to the child’s parents) about the child’s educational records. Additionally, the Family Educational Rights and Privacy Act makes it difficult for outsiders to obtain school directory information. Beyond these functions, school staff members are also helpful in distributing project-related information to parents, collecting and evaluating signed consent forms for their completeness, and reviewing the appropriateness of vaccination for each child. School staff members can also provide: (1) education sessions for parents, students, and staff; (2) incentives and rewards for classrooms with the most returned forms (eg, pizza, ice cream parties); (3) clinical and nonclinical staff to work in the school clinics; and (4) a means of communication with principals and other school officials. A well-planned system of communication needs to exist between the program lead and the school system from the beginning, particularly if the school system is not the lead agency.

Local health departments typically participate by receiving, storing, and distributing vaccine. Most health departments have the capacity to store vaccine in large quantities according to manufacturer specifications, whereas most schools do not. Schools commonly work through local health departments to obtain vaccine for routine immunizations by school nurses. The health department can design and prepare consent forms, bring together useful information related to the project, and obtain free copies of pertinent literature from a government agency or other sources to help parents consider vaccination of their child. Because the local health department is the lead agency for health-related emergencies, including bioterrorism events that involve mass distribution of antibiotics or mass vaccination, it can provide an oversight or management structure to help plan and conduct these events. Some but not all local health departments have sufficient vaccine delivery infrastructure to create or augment clinic staff rosters and provide leadership at each clinic. The state health department can purchase vaccine for children who qualify for the VFC program. By obtaining VFC vaccine from their state vaccination system, local health departments greatly decrease the amount of vaccine that would need to be purchased for an SLV clinic. Many state and local health departments also have the capacity to enter influenza immunization data into an existing immunization registry (immunization information system), track local vaccination coverage rates, assist in answering vaccine-related questions, and provide medical backup during the clinics and for postvaccination adverse events.

Other groups make valuable partners. Local professional medical societies, physician practices, and hospitals can provide information about the vaccination program to their members, patients, and parents. Their leaders can be spokespersons for the media, and their members can help staff the clinics. The local medical community can help obtain project funds by seeking extramural grants and donations. Community nonemergency call centers include “311,” which covers 55.8 million US residents in more than 70 large- and medium-sized cities and counties, and “211,” which covers all or part of 31 states and 78% of the US population.

These can be used to field questions and issues from parents and others concerning where to obtain consent forms and the clinic locations, dates, and times. Issues that the call center cannot address, such as specific medical questions, can be referred to the project leader or other responsible medical personnel according to protocol.

Local universities can help by providing nursing, medical, or other faculty or student support for the clinics or other aspects of the campaign. The expertise
of their faculty in the area of evaluation may be able to help determine the impact of these clinics on community health. The faculty can be effective proponents of the program, and can help write grants to enhance sustainability.

Parent-teacher associations and booster organizations make strong partners. These groups are accustomed to assisting in school activities, and understand at the outset what type of help will be needed. These groups can help increase awareness and positively influence the student body by emphasizing to band students, sports teams, and other extracurricular groups that their performance in these areas is directly related to maintaining good health, including prevention of influenza. Volunteers from parent-teacher associations and booster organizations can assist SLV clinics, particularly by preparing for and setting up the clinic, and organizing and providing classroom incentives to reward those classrooms with the highest proportion of returned informed consent sheets.

Vaccine manufacturers can help these campaigns by providing small grants to local health department immunization programs to (1) help create a network that educates and informs medical and community providers about the program and its intent; (2) provide educational materials for parents, children, schools, and the community; or (3) provide free giveaways (e.g., stickers, pens, and markers) for children upon vaccination. Vaccine manufacturers can help educate practicing physicians in the use of and contraindications to administering vaccines in general. Corporations may become invested in the success of such a program as a showcase for their health-related products used for these clinics and as a gesture of corporate goodwill. At KCHD, we received a $1.7 million grant from MedImmune, Inc (Gaithersburg, MD) in 2006, which was used through the 2009 to 2010 influenza season to purchase vaccine, conduct educational outreach activities, and provide school-located mass influenza vaccine clinics.

Government agencies, such as the Centers for Disease Control and Prevention, can help provide instructional material (e.g., vaccine information sheets) and substantial expertise concerning vaccine indications and contraindications, and safety. They also can help the program lead connect with immunization leaders around the country. Nonprofit immunization coalitions and advocacy groups, such as the Immunization Action Coalition, also can provide educational materials and advice about influenza and the immunization programs of its partners.

**COMMUNICATION**

Good communication is vitally important. The project leader and key community members need to communicate effectively with each other, and with parents, students, school administrators, faculty, the medical community, and community stakeholders. Each group is likely to have a specific stake, need, and preferred mode of communication. One of the most difficult aspects of communication is notifying parents and obtaining their informed consent. This topic is discussed fully elsewhere.4

Communications should also be developed for children so they can understand the need for the program and its benefits. This information should be age specific, match their developmental and reading level, and be written clearly and concisely. Material developed for elementary schoolchildren should be colorful and playful in directing the children to get vaccinated. Children in middle school respond well to information that provides reasons to get vaccinated against influenza. The message should promote their choice of the right action on the basis of them maintaining good health. Communication with high school students is more difficult and we have been unsuccessful in finding the right forum or message for this age group, as shown by the low vaccination rates achieved in Knox County.

Informing and educating school administrators and teachers is important because they exert a strong influence on their students. Any hint of apathy, adversity, or unenthusiastic support by an authority figure that indicated a low program priority would likely translate to lower vaccination rates in that school. Engendering the support of school officials and teachers can be aided by sending them frequent e-mails with meaningful information. The KCHD project leader sent messages directly to each school principal and his or her staff, rather than depending on intermediaries who might forget to relay the information, or do so inaccurately or with less emphasis than was intended.

To motivate school personnel, we created competition within or between schools for the classroom with the greatest percentage of returned forms. This included both consent and refusal forms. Statistics from all schools in the district were posted where school principals, the superintendent, and teachers would see them. This healthy competition among school administrators may lead them to encourage teachers and parents to strongly support the program.

Communicating the project plan to the medical community at an early date can help obtain valuable input and support. Such information can help local office-based influenza vaccine providers reduce their vaccine “preorder” amount to complement the SLV program, thereby reducing vaccine purchase costs and potential wastage of unused vaccine at the end of the season. One option is to use an SLV program to immunize most
that the optimal time to educate and fully. For the KCHD program, we found are focused on getting their curriculum in August or September. At that time, many vaccine formulations. School administrators, staff, teachers, parents and their young children, local immunization providers, and the community at large all need to be educated. Clinic staff members need to be given the purpose, scope, and details of their jobs, in addition to training in technical procedures. Education and training should be clear, concise, and timely, yet flexible enough to change to meet local needs as they arise. Education may occur through local media, school events, and direct mailings, and via partners. The optimal time for such education may vary among SLV programs. Many academic and extracurricular programs compete for attention at the beginning of the school year; whether in August or September. At that time, school administrators and teachers are focused on getting their curriculum under way quickly and successfully. For the KCHD program, we found that the optimal time to educate and

obtain the support of school staff was slightly earlier, just before the school year began. Education of school officials and teachers has 3 parts. Education of school administrators can begin when they are first approached for enrollment. The project leader and, if possible, other key planning committee members should schedule a meeting at each school with its school officials for early July. At this meeting, the project plan and possible clinic dates should be discussed, and educational materials should be disseminated. In late July or early August, another meeting should be held at each school so that staff can ask questions about the project plan and receive information about seasonal influenza. This information should focus on the importance of vaccinating children and its potential impact on the school, particularly lower school absenteeism and less teacher sick leave. Finally, the week before the school clinic occurs, each teacher and staff member at that school should be sent a reminder and talking points so they can inform others. Media campaigns are useful to conduct before the clinics are held using public service announcements, local radio and television talk shows, newspaper stories and advertising, and at school events. Radio and television public service announcements have been effective in communicating with some parent groups. Station employees will sometimes help prepare the announcement. A telephone information line can be established for parents to call to ask questions about the vaccine, vaccination process, clinic times and dates, and other concerns. KCHD employed several novel measures using current technology to communicate with parents and students, particularly those of disadvantaged groups. We established a link on the school and health department Web pages for people to e-mail questions or concerns, download consent forms, get information, or comment on the project. In the 2006 campaign, we offered grants to school-sponsored student groups to conduct educational sessions for students and parents. The student groups created podcasts; conducted sessions over the school intercom and television channel; prepared poster presentations and videos; and held educational sessions to discuss influenza, the importance of prevention, and the project itself. Vaccine providers in private practice have an interest in such programs in their community. They may want to reduce their early vaccine orders if they know the school district is going to offer these clinics. Further, providers might want to learn more about the benefits of influenza vaccination and the vaccine formularies available. Health departments, professional societies, hospitals, and other large organizations often have the capacity to quickly and efficiently reach their members through group fax and e-mail distribution lists. “Detail” representatives from the pharmaceutical industry provide substantial technical information to providers in their offices. Another method utilized by KCHD was to hold educational sessions for local providers (including continuing medical education credit); however, that program was discontinued because of low attendance.

CONCLUSIONS

Although vaccinating schoolchildren with 1 or 2 doses in a mass school clinic is a simple idea, preparing and sustaining such a program is quite complex. Quite a few groups need to buy in with their understanding and support, particularly the school office staff and officials and health department personnel. Early in the planning process, parents, teachers, immunization providers, media, and a host of other
stakeholders need to become invested in this process. Funding for vaccine and other supplies needs to be obtained. The planning stage can take 6 months or more. A successful program begins with early, thorough planning.

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