

# Challenges to School-Located Vaccination: Lessons Learned

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## KEY WORDS

school-located vaccination, adolescents, financial lessons

## ABBREVIATIONS

AMC—academic medical center

HMO—health maintenance organization

HPV—human papillomavirus

MCV4—meningococcal conjugate vaccine

POS—place of service

SLV—located vaccination

Tdap—tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis, absorbed

UICMC—University of Illinois at Chicago Medical Center

VIS—vaccine information sheets

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## abstract

School-located vaccination (SLV) has a long history in the United States and has successfully contributed to lower morbidity and mortality due to vaccine-preventable diseases.<sup>1</sup> Historically, SLV efforts, which tended to be single-vaccine programs intended to provide catch-up immunization to a defined school-age cohort or were implemented in response to an outbreak, were unfunded, funded by local health department, or were funded by industry or federal grants. The growing palette of vaccines recommended for routine use in adolescents along with limited success of office-based adolescent immunization create a compelling argument for the creation of financially sustainable SLV programs. An arguably significant barrier to both office-based and school-located adolescent immunization is the modest reimbursement rates afforded to immunizers. Because the immunization promotion and consent process is expensive, these costs must be reduced to a minimum to reach financial viability. Although there are challenges to creating a financially sustainable SLV program coordinated by an academic medical center, (AMC), the ability of AMCs to bill private and public insurers, the nonprofit status of medical centers, the allowances for faculty for academic pursuit, and the substantial infrastructure already present make AMCs a potentially practical site for the administration of SLV programs. Alternatively, as health departments throughout the nation continue to explore methods for billing private insurance, we may find health departments to be uniquely suited for coordinating the administration and billing of these services. *Pediatrics* 2014;134:803–808

School-located vaccination (SLV) has a long history in the United States and has successfully contributed to lower morbidity and mortality due to vaccine-preventable diseases.<sup>1</sup> Following the 2008 recommendation by the Advisory Committee on Immunization Practices for annual influenza vaccination of all children 6 months to 18 years of age<sup>2</sup> (a recommendation that added nearly 30 million children to the cohorts targeted for annual influenza vaccination<sup>3</sup>), local and state-wide influenza SLV clinics were implemented to increase immunization rates. In addition to serving as an immunization safety-net for school-age children, SLV clinics can reach adolescents, a population shown to access preventive health care infrequently,<sup>4</sup> a trend that leaves few opportunities for vaccination.<sup>5</sup> Both historically and recently, SLV clinics have focused on delivering a single vaccine, such as influenza or hepatitis B, to meet a specific and time-limited public health goal, such as immunization during a disease outbreak or immunization of a catch-up cohort. Similar to many initiatives in public health, SLV programs are typically dependent on grant funding, rarely bill third-party or government payers, and are not, therefore, designed to be independently financially sustainable.

Health4Chicago is an SLV program, directed to adolescents, that uses a novel, multidisciplinary approach with the goal of providing financially sustainable at-school immunization of adolescents and school-age children. Health4Chicago provides education about recommended vaccines, facilitates Medicaid enrollment for uninsured students, and encourages families to establish care at a medical home. Through a collaboration of clinicians, researchers, billing experts, school administrators, and public health professionals, an important goal of the Health4Chicago program is to determine how best to use third-party billing to enable a financially sustainable SLV program.

## METHODS

### Setting

The Chicago Public Schools is the third largest school district in the United States, composed of 681 schools and >400 000 students (44.1% Hispanic; 41.6% African American; 8.8% White; 5.5% other; 87% low income).<sup>6</sup> Similar to other states, there were no adolescent vaccines required for matriculation into Illinois public schools until recently. Beginning in fall of 2012, all students “entering, transferring, or advancing into” grades 6 and 9 are required to provide proof of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis, absorbed (Tdap) immunization.<sup>7</sup> As of fall 2013, this state requirement was expanded to include all grades 6 through 12.<sup>8</sup>

### The Program

Now in its fifth year, Health4Chicago is a partnership between 2 academic medical centers (AMCs), the University of Chicago Medicine and the University of Illinois at Chicago Medical Center (UICMC), established to provide SLV in Chicago area schools. UICMC serves as the immunizer of record for uninsured students and for students with public insurance, whereas University of Chicago Medicine serves as the immunizer of record for students with private insurance. This arrangement was established because of varying reimbursement rates from third-party providers among the institutions due to negotiated contracts. Importantly, this distinction between privately and uninsured/publicly insured patients exists only for financial record keeping, for the use of Vaccines for Children vaccine stock, and for billing; immunization clinics are run with no visible distinction between students of each payer status. During the 2013–2014 academic year, the program served nearly 40 schools, administering >2100 vaccines to >1700 children and adolescents.

## Lessons Learned

### *AMCs Are Not Ideal Homes for SLV Programs*

Most SLV programs were founded as collaborations between schools and a local health department, AMC, or both. Health4Chicago was formed as a collaboration between several Chicago public and private schools and 2 AMCs. Although AMCs can, unlike most local health departments, bill both private and public insurers, operation of a SLV program coordinated by AMCs poses several challenges.

### *In Large Medical Centers, Business Decisions Occur Slowly and Require Multiple Approvals*

For example, a place of service (POS) code is required for professional claims to be filed with third-party payers. Although the Centers for Medicare and Medicaid Services recognizes “school” as a POS for filing of professional claims,<sup>9</sup> individual payers have unique reimbursement policies associated with each POS code, making it difficult to predict if SLV services will be reimbursed, and, if so, at what rate. In addition to these national codes, internal generation of a POS is also necessary for billing purposes. Because Health4Chicago has provided immunization services at nearly 40 schools in the Chicago area, 40 internal codes had to be established within the AMC billing system. Creation of each of these AMC-recognized POS codes required several levels of administrative approval, requiring up to 2 weeks’ time. It should be noted that this administrative delay did not affect time to vaccine administration; SLV clinics were held regardless of this administrative process; however, this did delay billing for vaccine services in some instances

### *Many Medical Centers Are Not Financially Transparent*

Although we appreciate that reimbursement for vaccine administration paid by private carriers varies significantly, we

have yet to receive consistent answers from AMCs regarding how much private payers reimburse for immunization. Similarly, we found it challenging to learn what Health4Chicago was paying for vaccines.

A high proportion of vaccine doses administered by Health4Chicago are obtained through the Vaccines for Children program and administered to Medicaid recipients, but Health4Chicago must purchase vaccines to administer to privately insured children, which is done through the AMC's pharmacy purchasing program. We have been unable to ascertain exactly what the AMC pays for vaccines, what overhead costs are applied to each purchase, and final costs to Health4Chicago. This may be attributable to batch purchasing and the inability to separate costs. This limited transfer of accurate financial data prohibited Health4Chicago staff from maintaining accurate financial records.

#### *Medical Centers Levy Overhead Charges on Clinical Revenues*

In addition to fees covering the overhead cost of billing, AMCs also levy administrative fees (ie, "dean's tax") on clinical revenue ranging from 10% to 15%. This loss of billing revenue has a proportionally greater impact on an SLV program compared with a large clinical department because the program uses few direct AMC resources and functions on a small margin.

#### *Medical Center Billing of SLV Must Be Appropriately Housed*

Preventive services, including immunization, can be misidentified as nonpreventive by insurance companies if billed through a hospital-based billing center, rather than an outpatient practice. Initially, Health4Chicago's billing system was modeled as a stable off-site clinic through the hospital-based billing center. As a consequence, patients whose insurance viewed these services as "nonpreventive" received sizable bills

for immunizations. Months of research were required to identify and correct this problem. Over a 6-month period, Health4Chicago worked to transfer the billing process away from a hospital model over to an ambulatory billing model. This allowed for compliant billing that payers recognized as a reimbursable location to receive preventive care services.

#### *Uncertainties Exist About Immunization-Associated Risks*

Understanding the legal risks incurred by vaccine administrators and schools in holding a SLV clinic proved to be challenging for school district and AMC attorneys. Attorneys were shown that the National Childhood Vaccine Injury Act of 1986 provides liability protection to immunizers and covered all vaccines offered by the program.<sup>10</sup>

#### *Many Medicaid-Eligible Students Are Not Enrolled in Medicaid.*

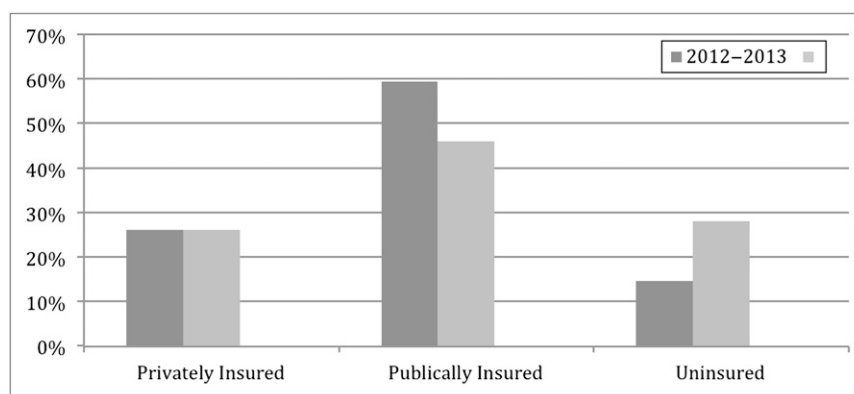
Twenty-two percent of Medicaid-eligible children immunized by Health4Chicago were uninsured. As shown in Fig 1, the proportion of uninsured students served by Health4Chicago increased by 52.5% between 2012 and 2013 (15% of students immunized in 2012, 22% of students immunized in 2013). This increase in the proportion of uninsured students was an unforeseen consequence of the mission of Health4Chicago

(to target schools that may benefit most from SLV) and the school district's endorsement of the Health4Chicago program. Health4Chicago's success led district officials to direct the program to its most underresourced schools with a large number of unvaccinated students and subsequently large numbers of uninsured students.

To address this problem, we sought collaboration with the school district's dedicated Medicaid enrollment team. We reported all uninsured children immunized to the enrollment team who could then enroll (or reenroll) eligible children into state Medicaid, allowing (and other providers) to bill Medicaid successfully. Unfortunately, the Medicaid enrollment team was unable to enroll students in a timely manner. Instead, billers at UICMC took it upon themselves to enroll or reenroll children into Medicaid, allowing the university to bill successfully for immunization services.

#### *Health Maintenance Organizations May Not Pay for SLV*

In the United States, childhood vaccines are typically administered in the clinical setting of a primary care provider. Thus, many health maintenance organizations (HMOs) do not reimburse for vaccines administered in nontraditional settings. State Medicaid HMO plans designate childhood immunization as a "carve-out" service and will reimburse for



**FIGURE 1**  
Payer mix in Chicago area schools served by Health4Chicago, 2012–2013.

vaccination delivered at school. However, we found nearly all commercial HMOs denied coverage for school-located services, necessitating additional prescreening efforts by Health4Chicago to inform HMO-enrolled families that they may receive a bill for vaccines administered at school. Health4Chicago staff contacted all HMO payers to confirm plan benefits for any student who listed a HMO on the consent document. This prescreening process was time-consuming and costly and is not sustainable.

### *The Vaccination Promotion and Consent Process Is Expensive*

A substantial proportion of Health4Chicago expenses are incurred with the promotion and consent process. Surveys of parent preferences in 2011 led to the development of a multipage color brochure that included promotional information about the medical home, vaccine-preventable diseases, recommended vaccines, and general information about Health4Chicago. In keeping with federal policy, the Centers for Disease Control and Prevention vaccine information sheets (VIS) for all 4 adolescent vaccines (human papillomavirus [HPV], Tdap, meningococcal conjugate vaccine [MCV4], and influenza) were attached to our consent document and sent home with students. Printing costs for the 2012–2013 academic year (serving 34 schools) was 35.2% of our total operating budget (Table 1). During the 2012–2013 academic year, Health4Chicago began a cost-reduction initiative to be fully implemented by fall 2013. This initiative

included partnership with bulk printing vendors, resulting in a reduction of printing costs lead to a 59.2% decrease in promotional material expenses. Despite these reductions, promotional materials still accounted for nearly 30% of all costs associated with this SLV program.

SLV programs may be held to a higher standard of informed consent than other immunizers. As part of the immunization consent process, the National Childhood Vaccine Injury Act asserts a federal requirement on vaccinators to provide to patients and parents Centers for Disease Control and Prevention VIS before administration of each vaccine dose.<sup>10</sup> Although VIS documents were not created to serve as informed consent documents, they may be (and frequently are) used as such in clinical settings so long as they conform to state laws.<sup>11</sup> Unfortunately, there is little statutory guidance on the subject of adolescent immunization consent, leaving decisions about the form and substance of the adolescent immunization consent process to individual states, school districts, and medical centers.<sup>12,13</sup>

Because Health4Chicago is a highly visible program, serving children in public and private schools, we have maintained that no child is immunized without a completed parental consent form. If there are questions about the consent (eg, illegible writing, missing signature, comments such as “give everything,” requests for additional vaccines), a parent is contacted by a program nurse or coordinator. Telephone-based clarifications and consent are documented for

all contacted parents. This process is time-consuming and requires significant staff effort.

### *School Immunization Requirements Can Confuse Immunization Priorities of Parents and School Personnel*

School nurses and parents equate school immunization requirement with a vaccine's relative importance compared with other vaccines. Because HPV and MCV4 immunizations are not required for continued matriculation in Illinois, nurses and teachers interpreted the nonrequirement to mean that receipt of these vaccines is optional and unimportant. In 1 case, a school nurse discarded all forms granting consent for HPV vaccine because the vaccine is not required to meet school compliance. This resulted in potentially lost revenue and underimmunized adolescents.

### *The Lack of a Robust State Vaccine Registry Leads to Uncertainty and the Possibility of Overvaccination*

Provider participation in the Illinois state vaccine registry has been optional for immunizers since the registry began. In 2013, Vaccines for Children providers in Illinois were required to order vaccines through the registry, but comprehensive use is not yet required.<sup>14</sup> Consequentially, immunization data in the state registry are incomplete. Furthermore, because health care in medically underserved areas can be fragmented, there was no single place to go for immunization records, leading to considerable uncertainty about what vaccines some children

**TABLE 1** Proportion of SLV Program Costs Before and After a Cost-Reduction Initiative

Program Costs	Fall 2012 Proportion of Costs (%)	Spring 2013 Proportion of Costs (%)	Fall 2013 Proportion of Costs (%)	Percent Change in US Dollars Spent (%)
Promotional materials	35.2	35.2	29.3	−59.2
Injection supplies	8.8	8.8	18.3	1.3
Transportation supplies	2.0	2.0	1.7	−58.5
Vaccine administrators	8.3	8.3	4.3	−74.7
Programatic overhead	45.6	45.6	46.5	0
Total cost	100.0	100.0	100.0	

Although proportion of costs are shown for each semester, the percent change presented is in US dollars spent, not the change in proportion of costs.

had received. In past years, with parent permission, Health4Chicago attempted to assist in rectifying vaccination records for students by reviewing vaccination documentation provided by parents, schools and the state vaccination registry. This process was found to consume 20 to 60 minutes of nursing time per student, which was cost-prohibitive. Because of this, Health4Chicago adopted 4 policies: first, we focused immunization efforts on students in grades 5 through 8 because the likelihood that a child had already received HPV, Tdap, or MCV4 vaccines was found to be low. Second, we administered vaccines based on the parent consent form only. Third, if a child stated that he or she had received a specific vaccine, the parent was contacted to confirm this assertion before vaccination. Fourth, we assumed that the risks of undervaccination exceeded the risks of overvaccination; thus, if a parent was unsure if their child was unvaccinated but provided consent, we proceeded with vaccination. In addition to keeping our own records, Health4Chicago reports all vaccines administered to the state vaccine registry, to the school district, and to parents via a printed report. The printed report is intended to serve as proof of vaccination for the patient's routine medical provider.

## CONCLUSIONS

Historically, SLV efforts, which tended to be single-vaccine programs intended to provide catch-up immunization to a defined school-age cohort or were implemented in response to an outbreak, were unfunded, funded by local health department, or were funded by industry or federal grants. The growing palette of vaccines recommended for routine use in adolescents and the limited success of office-based adolescent immunization create a compelling argument for the creation of financially sustainable SLV programs. Unfortunately, grant funding is not dependable over time. Therefore,

to create financially sustainable programs for school-located health services, efficient means for using third-party payers must be developed.

Although there are challenges to creating a financially sustainable SLV program within AMCs, the ability of medical centers to bill private and public insurers, the nonprofit status of medical centers, the allowances for faculty for academic pursuit, and the substantial infrastructure already present make AMCs a potentially practical site for the development of these programs. However, there are several things that can be done to increase the likelihood of program success:

1. Because AMCs are not financially transparent, it is important that unique cost centers be established for all aspects of the program, including vaccine purchasing, printing of promotional materials, personnel, and supplies.
2. It is important that medical center overhead and billing expenses be incorporated into the program budget.
3. The guidance of a financial administrator with substantial firsthand medical center experience is essential.
4. The immunization program should identify means for enrolling Medicaid-eligible but uninsured children into state Medicaid. Once children are enrolled into Medicaid, state Medicaid can be billed retroactively (for up to 120 days in Illinois) for immunization services.

Alternatively, as health departments throughout the nation continue to explore methods for billing private insurance, the administration of school-located health services within the health department may allow for greater efficiency. Although efforts to improve vaccination rates among children and adolescents may require the collaboration of a variety of health care delivery models, health departments may be uniquely suited to

coordinate the administration and billing of these services. Further research in this area is needed.

Given the modest reimbursement rates for immunization, SLV programs must be cost-efficient. The high costs of printing and the inefficiencies of "back-pack mail" may be overcome with the creation of Internet-based promotions and consent. Although concerns exist around a possible economic "Internet gap," the high prevalence of smart phones suggests that creation of an electronic promotions and consent process aid in cost-efficiency. However, estimates of Internet accessibility among low-income families are needed to determine feasibility. As SLV programs become more common, standards for, and standardization of promotional and consent materials will be needed.

An arguably significant barrier to both office-based and school-located adolescent immunization is the modest reimbursement rates afforded to immunizers. Because the immunization promotion and consent process is expensive, these costs must be reduced to a minimum to reach financial viability. Currently, baseline reimbursement from Medicaid for administering a dose of vaccine in the state of Illinois is \$6.50. Cost of vaccine administered in schools have been reported to range from \$13.51 to \$24 per dose, meaning on-average only 34% of costs associated with administering 1 dose of vaccine are reimbursed by Medicaid in Illinois.<sup>15,16</sup> A provision of the Affordable Care Act offers for the period January 1, 2013, through December 31, 2014, enhanced reimbursement for immunization services delivered by primary care physicians with specialty designations of family medicine, general internal medicine, or pediatric medicine.<sup>17,18</sup> This enhanced immunization administration reimbursement will be \$24 per dose in Illinois.<sup>18,19</sup> Although this enhanced payment for vaccination is currently restricted to eligible providers,

this higher reimbursement rate approaches the costs incurred promoting and administering vaccines in schools. Thus, maintaining this enhanced reimbursement is essential to the financial sustainability of SLV programs. Accompanying enhanced Medicaid reimbursement must be provisions encouraging Medicaid enrollment of eligible but uninsured children. Once a child is enrolled or reenrolled into Medicaid, there must be allowances of  $\geq 120$  days allowing retroactive billing for immunization services.

Billing for immunization services to children covered by Medicaid and private insurance HMOs is especially challenging because HMOs may not pay for immunization outside of the medical home. A carve-out for immunizations outside of the HMO is necessary.

SLV programs have long served as a supplement to traditional health care in the United States. The creation of a SLV program is a complex undertaking. Standardization of payments from private insurers would overcome the

seemingly insurmountable complexity of the reimbursement system. Until such standardization occurs, knowing and ensuring correct payment for immunization from private insurers requires the guidance and substantial time commitment of a capable financial administrator. If the current Medicaid reimbursement expansion demonstrates adequate reimbursement for preventive care services, including vaccination, we can hope to see an increase in the number of adolescents who are adequately vaccinated.

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