

# A School-Located Vaccination Adolescent Pilot Initiative in Chicago: Lessons Learned

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**Background.** Many adolescents underutilize preventive services and are underimmunized.

**Methods.** To promote medical homes and increase immunization rates, we conceptualized and implemented a 3-year, 8-school pilot school-located vaccination collaborative program. We sought community, parent, and school nurse input the year prior to implementation. We selected schools with predominantly Medicaid-enrolled or Medicaid-eligible students to receive Vaccines For Children stock vaccines. Nurses employed by a mass immunizer delivered these vaccines at participating schools 3 times a year.

**Results.** Over 3 years, we delivered approximately 1800 vaccines at schools. School administrators, health centers, and neighboring private physicians generally welcomed the program. Parents did not express overt concerns about school-located vaccination. School nurses were not able to participate because of multiple school assignments. Obtaining parental consent via backpack mail was an inefficient process, and classroom incentives did not increase consent form return rate. The influenza vaccine had the most prolific uptake. The optimal time for administering vaccines was during regular school hours.

**Conclusions.** Although school-located vaccination for adolescents is feasible, this is a paradigm shift for community members and thus accompanies challenges in implementation. High principal or school personnel turnover led to a consequent lack of institutional memory. It was difficult to communicate directly with parents. Because we were uncertain about the proportion of parents who received consent forms, we are exploring Internet-based and back-to-school registration options for making the consent form distribution and return process more rigorous. Securing an immunization champion at each school helped the immunization processes. Identifying a financially sustainable school-located vaccination model is critical for national expansion of school-located vaccination.

**Key words.** School-Located Vaccination; Adolescents; Medical Home

## BACKGROUND

Chicago Public Schools is the third largest school district in the United States, with 675 schools and over 400 000 students (42.6% African American; 43.7% Hispanic; 8.6% White; 5.1% “other” [1]; 84.9% low-income [2]). The process for matriculation into grades six and nine includes a completed physical examination within the preceding year and proof of vaccinations [3]. Despite district health requirements, less than 10% of Chicago Public School students have received recommended vaccinations for 11-year-olds (tetanus, diphtheria, pertussis [Tdap]; meningococcal; human papillomavirus [HPV]) [4].

To improve strategies that identify medical homes (a team-oriented home base for a child’s medical and non-medical care) and to increase the percentage of adolescents who receive universally recommended adolescent vaccines, we developed the Health4Chicago: Helping Students Grow Strong program. We conducted a pilot project to (1) design a sustainable school-located adolescent health promotion model that could be expanded to additional communities and (2) determine barriers and facilitators associated with program implementation. In the next section, we describe the processes we used to establish, implement, and initially assess this 8-school, 3-year school-located public health program.

## PHASE I: PROGRAM PLANNING

### Community Engagement

In 2008, we explored priorities for Chicago Public Schools and sought ways to engender community support through the involvement of parents, students, school district officials, teachers, school district attorneys, and local community organizations. During several meetings with stakeholders, we were advised that by first promoting our program for medical homes and then establishing a program for immunizations, our public health program would be more accepted by the school system than if we focused on immunizations exclusively. School attorneys initially expressed reservations about school-located vaccinations due to concerns about liability and risks of vaccine-related adverse effects. Concerns were based on an overestimation of the real risks of immunization and a lack of awareness of the National Vaccine Injury Compensation Program and its concomitant no-fault protections afforded to immunizers.

### Parental Engagement

To better understand Chicago Public Schools, parents' perceptions of adolescent vaccines and school-located vaccination, and to seek feedback on consent forms and education materials, we conducted two focus groups in 2009 with parents affiliated with program-participating schools. Although parents acknowledged that school-based vaccination was a new concept for them, they generally supported the idea. Most parents requested that they be given ample time to consent for vaccines and to receive answers to their questions. Parents raised some questions about vaccine safety. None expressed concerns about HPV or any other vaccine. Most parents were unaware of the recommended adolescent vaccines and wanted straightforward guidance with photographs graphically depicting vaccine-preventable diseases (versus "sugar coating" the information).

### School Engagement

We selected 8 elementary- and middle school-age students to participate in Year 1 of the Health4Chicago program. These schools are in medically underserved communities and have at least 80% Medicaid-eligible or Medicaid-enrolled students. All eight schools accepted our invitation. One-half of Year 1 (2009–2010) schools were not able to join again in Year 2 (2010–2011). Of the 4 schools that did not participate in Year 2, 2 had major principal or staff turnover, and thus we were unable to secure their commitment by the start of the academic year. One of these 2 schools had a previously established relationship with a mobile medical provider who was going to provide vaccines again. The second school

did not respond to our offer to participate in Year 2. A third school expressed interest in participating months after the school year started, and the fourth school's administrators never provided feedback as to why they declined to participate again. We then selected 4 new schools in Year 2, focusing on schools associated with the 4 returning schools from Year 1 and schools that contacted us requesting to participate. Year 3 (2011–2012) comprised 7 of the 8 Year 2 schools plus 2 additional schools.

### School Nurse Engagement

We anticipated that school nurses would be key program stakeholders. We did not intend to burden nurses with additional responsibility but rather hoped nurses could serve as liaisons between our program and families. Many of the school nurses we contacted are responsible for 3–4 schools and up to 3000 students. Thus, most school nurses were unable to participate due to competing job obligations. Our experience is similar to other school-located influenza vaccination clinics that found schools nurses' competing priorities limit their involvement in immunization activities [5].

### Medical Homes Promotion

We firmly believe that school-located vaccination is not a substitute for routine medical care provided by a health-care professional. Rather, school-located vaccination complements a healthcare system that leaves many adolescents without regular care, which often results in missed opportunities for vaccination [6]. Implicit in the design of Health4Chicago is the principle that school-located vaccination must not compete with the medical home. Although a high percentage of children aged 19–35 months use a medical home to receive all childhood vaccinations [7], the same is not true for adolescent vaccination [8].

Health4Chicago directors spoke with administrators from Federally Qualified Health Centers and private physicians near participating schools. None of the administrators or physicians expressed concern that a school-located vaccination program would compete with their clinic-based vaccination efforts. Physicians reasoned that most of the students vaccinated at school would likely not be seen for care at all if it were not for our program. This sentiment parallels a 2009 survey which showed that only 28% of pediatricians were concerned about loss of income as a result of patients referred to another site for vaccination [9].

### Liaison and Champion Engagement

We hired nursing students from a nearby community college to work part-time as school liaisons. Liaisons

were charged with meeting with parents, teachers, and administrators, and attending family events. They attempted to identify an immunization champion at each school. Because each school is unique, the optimal person to serve as immunization champion varied by school and required flexibility to foster individual relationships.

#### **Program Branding**

We secured the services of a graphic designer to help brainstorm and select a brand for our program that would elicit value to parents and students. Although parents in our initial focus groups said they use “shot” in their everyday language, we were advised by school personnel to avoid “shot” in the name or logo so the program would not be associated with firearms. We also learned to avoid certain colors for our logo, because they could be associated with neighborhood gangs. The final brand includes soft lavender, yellow, and white colors. The “4” in the program name, “Health4Chicago,” deliberately serves as a learning tool because the program promotes the 4 recommended adolescent vaccines. “Chicago” in the name can be replaced with any other city’s name in the future.

#### **Consent and Parent Communication**

Although the traditional approach of sending home consent forms for parent signature and return to school is an accepted practice, this method for obtaining consent is relatively inefficient (often requiring that forms be sent home 3 times to reach a 70% return rate [10–12]). We first approached the school district inquiring about standards for an immunization consent process and learned the district had no standardized immunization consent forms. The school district explained that the consent process was between the student’s parent and the individual who would administer the immunizations. We contacted a representative of a commercial mass immunization office and inquired about its consent materials. We were then informed that the consent process was the responsibility of the program sponsor. The Chicago Department of Public Health felt that the consent process was typically the responsibility of the immunizer. We then consulted with hospital attorneys who initially gave us a 7-page research consent form that was not necessary because we were not conducting research. We thus created our own consent forms for (1) adolescent immunizations, (2) influenza immunization, and (3) childhood “catch-up” immunizations. Our consent forms were approved by the school district prior to use.

The “Adolescent Consent Form” allows parents of 5th and 8th grade students to grant consent for their child to

be immunized with HPV (initially for females and later for males too), Tdap, quadrivalent meningococcal conjugate (MCV4), and seasonal influenza vaccines. The consent form provided parents with 3 consent options: (1) accept all recommended adolescent vaccines; (2) select specific adolescent vaccines; or (3) opt-out of all vaccines. To confirm that all families had the opportunity to participate, we included the option to opt-out and requested that all 5th and 8th graders return a signed adolescent consent form. The “Influenza Consent Form” grants consent for a single dose of seasonal influenza vaccine (and Influenza A [Hemagglutinin 1 Neuraminidase 1] virus [H1N1] vaccine in 2009–2010) used for any student (regardless of grade) and school staff member. The “Childhood Vaccine Consent Form” grants consent for administration of catch-up vaccines provided by the school district. All signed forms are valid for the entire academic year and for all doses of multi-dose vaccines. All consent forms are written with limited literacy principles in mind and list a telephone number of a Nurse Practitioner who can answer health- and immunization-related questions and route calls to a physician as needed.

## **PHASE II: PROGRAM IMPLEMENTATION**

#### **Program Design**

In Year 1 (2009–2010), we began the 8-school pilot project funded by the Chicago Department of Public Health. Implementation of the full program was delayed when the Chicago Department of Public Health asked that we redirect resources solely toward seasonal influenza A and H1N1 immunizations due to the impending influenza epidemic. Schools welcomed our program with as little as 10 days’ notice. In Year 2 (2010–2011), we initiated the complete Health4Chicago program, offering medical homes promotion and school-located vaccination for 5th and 8th grade students with the 4 universally recommended adolescent vaccines. We also offered catch-up childhood vaccines for students who were out of compliance with district immunization requirements, and we volunteered to provide seasonal influenza vaccines to the entire school including staff. Three vaccination dates were scheduled at each school to facilitate appropriate spacing for multidose vaccine series and allow several opportunities to vaccinate. The first vaccination date occurred before October 15, 2011, which was the Chicago Public Schools’ health compliance deadline. A contracted commercial mass immunizer hired nurses to administer Vaccine For Children vaccines.

Initially, schools encouraged us to schedule immunization days to coincide with extracurricular activities (school orientations, picnics, assemblies, report card pick-ups). Immunization uptake at such events was low. Many eligible students were not in attendance during extracurricular events, and parents and students are not typically in an immunization mindset during such events. Immunization rates improved when we vaccinated during regular school hours.

#### Consent Form Return

Three times a year, the Health4Chicago staff asked 5th and 8th grade teachers to give students an adolescent education packet to take home and ask parents to return a signed consent form. During influenza season, we asked that all students and school personnel be provided an influenza education and consent form packet. At each school, our school liaisons collected consent forms from teachers every week. The practice of sending home consent forms and education materials via student backpack mail and relying on teachers to coordinate the process was not efficient. To manage consent form returns, we relied heavily on school personnel and teachers to distribute and collect forms. Despite our efforts to distribute consent forms to all classrooms, we were unable to confirm whether all parents of eligible students actually received the forms. After the observation period, we learned that in some classrooms consent forms were either lost or never distributed. Subsequently, vaccination rates were estimated based on the total student body at each school (Tables 1–3). We provided classroom incentives (ie, pizza party) to encourage consent form completion, keeping in mind that parents could opt out of vaccination, but these incentives did not increase the return rate of consent forms.

Approximately 15% of returned consent forms were not fully completed by parents or guardians (missing signatures, unclear documentation about which vaccines the

parent authorized). Although the process was laborious, our research staff rectified approximately 80% of incomplete consent forms by reaching parents by phone. If an incomplete consent form could not be rectified, we did not administer vaccines to that student. Our experience is similar to other school-located vaccination programs that focused on seasonal influenza and found incomplete and inaccurate consent forms [5].

#### School-Located Vaccination

During 2009–2010 (Year 1), we administered 1108 doses of influenza vaccine (seasonal and/or H1N1; 280 + 68 + 380 + 380 [we double counted 380 because it accounts for 2 vaccines] [Table 1]) to 507 students and 221 faculty members and parents in 8 schools. Slightly more than half (52%) received both seasonal and H1N1 influenza vaccines, approximately one-third (38%) received only the H1N1 vaccine, and slightly less than 10% received only the seasonal influenza vaccine (Table 1). In 2010–2011 (Year 2), we offered all adolescent vaccines to 5th and 8th graders in 8 schools and influenza and catch-up vaccination to the entire school. We provided 199 total vaccines, more than half (57%) of which were seasonal influenza vaccinations. The next most frequent vaccine delivered was Tdap (13% of all vaccines), followed by HPV (8%) and MCV4 (4%) (Table 2). In 2011–2012 (Year 3), we again offered all adolescent vaccines to 5th and 8th graders in 9 schools. We provided 483 total vaccines, more than half (53%) of which, again, were seasonal influenza shots. Human papillomavirus was the next most frequently delivered vaccine (23% of all vaccines), followed by Tdap (10%) and MCV4 (8%) (Table 3). Catch-up childhood vaccines were available in Years 2 and 3 to students of all ages who were missing any vaccines required for school enrollment.

Schools with an invested immunization champion that had regular contact with Health4Chicago liaisons tended to have higher numbers of individuals vaccinated

Table 1. Health4Chicago Program Influenza Vaccines Administered by School, Year 1 (2009–2010)

School	Vaccines Administered			Vaccine Recipients			Total Number Individuals Vaccinated	Estimated Student Vaccination Rate <sup>a</sup> (%)
	H1N1	Seasonal	Both	Faculty	Parent	Student		
G	40	7	71	19	11	88	118	37
C	12	6	33	10	0	41	51	15
D	27	10	56	39	6	48	93	16
E	44	4	43	25	0	66	91	20
H	9	6	89	37	0	67	104	22
A	36	32	53	46	1	74	121	15
F	106	1	7	15	0	99	114	38
B	6	2	28	12	0	24	36	n/a
Total	280	68	380	203	18	507	728	

Abbreviation: n/a, number of students unknown.

<sup>a</sup>Vaccination rates are estimated based on the total student body at each school.

Table 2. Health4Chicago Program Vaccines Administered by School, Year 2 (2010–2011)

School	Vaccines Administered					Vaccine Recipients			
	Tdap	Influenza	HPV	Meningococcal	Other Vaccines <sup>a</sup>	Total Vaccines	Total Students Vaccinated	Total Staff Vaccinated	Estimated Student Vaccination Rate <sup>b</sup> (%)
J	1	0	0	0	10	11	5	0	<5
A	1	13	0	0	1	15	4	10	<5
D	1	1	0	0	1	3	2	1	<5
H	4	13	3	0	3	23	9	10	<5
L	16	9	12	8	18	63	24	4	<5
G	0	11	0	0	0	11	11	0	<5
K	0	15	0	0	0	15	10	5	<5
I	2	51	0	0	5	58	25	30	<5
Total	25	113	15	8	38	199	90	60	

Abbreviations: HPV, human papillomavirus; Tdap, tetanus, diphtheria, pertussis.

<sup>a</sup>Childhood vaccines include hepatitis B, measles-mumps-rubella, inactivated polio vaccine, and Tdap.

<sup>b</sup>Vaccination rates are estimated based on the total student body at each school.

compared with schools without a champion. In particular, Year 1 schools A, F, and G, Year 2 schools I and L, and Year 3 schools A and K had such champions and saw higher numbers of individuals and students vaccinated (Tables 1–3).

We received approximately 10 parent phone calls per year. Most parents had questions about the safety or eligibility of vaccines. The most commonly asked question was whether a child with a recent febrile illness could receive vaccines. Most parents inquired about the safety of influenza vaccination, in particular, and in relation to an illness. The second most commonly asked question was whether an individual child needed a specific vaccine. Most of these calls related to adolescent vaccines, specifically the meningococcal vaccination and HPV vaccine.

The processes used to identify students potentially out of compliance with childhood vaccines were inconsistent across schools. On multiple occasions, students “flagged” as needing vaccines would arrive on our immunization day with up-to-date vaccine records in hand, which proved they already had the required immunizations. Discussions with families and school nurses revealed that students were likely inaccurately identified as noncompliant because families had not provided vaccination documentation to the school or vaccination records were not accurately documented by school personnel.

Documenting medical compliance by Chicago Public Schools students is onerous. Illinois does not currently have a mandatory statewide vaccine registry. Immunizer participation in the Illinois vaccine registry is voluntary, resulting in underreporting of immunizations administered. School nurses often use the Illinois vaccine registry to determine which students are not in compliance with district-mandated requirements, and this process unfortunately results in the over-identification of noncompliance. The absence of a mandatory state vaccine registration

program to confirm vaccination status complicates school-located efforts; therefore, we hired a clinician with expertise in immunization schedules to occasionally be available to our immunizers.

## DISCUSSION

Health4Chicago is a unique school-located health promotion and immunization program that was created to test the feasibility of, and identify barriers to, school-located adolescent vaccination initiatives. Our mission is to improve adolescent vaccination rates for students who may not have regular access to a medical provider while attempting to link families to providers in their community. We successfully delivered approximately 1800 vaccines while identifying numerous challenges to the provision of at-school immunization. Immunization rates for HPV, MCV4, and Tdap vaccines were lower than we hoped, but they increased each year. Providing vaccines at school is a paradigm shift for schools and families, and, like most public health efforts, adoption of a new paradigm takes time.

Over the course of the 3-year pilot, although schools generally welcomed our program, not all schools participated from year to year. School administrators who did not provide feedback as to why they did not participate in a subsequent year could have had concerns about our program. Over the past 3 years, we have interacted with numerous principals, teachers, staff, and administrative personnel, and no one expressed overt concern about our program, apart from questioning whether we require a time commitment from school personnel, and we allay such concerns when we explain the program. Although identifying the most effective contact at each school required trial and error, this process was a critical step in the success of the program and highlighted the diversity



Table 3. Health4Chicago Program Vaccines Administered by School, Year 3 (2011–2012)

School	Vaccines Administered						Vaccine Recipients				Percent Change in Number of Vaccines Administered Year 2–Year 3
	Tdap	Influenza	HPV	Meningococcal	Other Vaccines <sup>a</sup>	Total Vaccines	Total Students Vaccinated	Total Staff Vaccinated	Estimated Student Vaccination Rate <sup>b</sup> (%)	Number of Vaccines Administered Year 2–Year 3	
I	9	40	26	8	0	83	27	17	<5	43%	
M	10	25	23	10	1	69	23	4	6	n/a <sup>c</sup>	
J	4	23	18	2	2	49	18	6	<5	346%	
A	3	40	10	1	12	66	32	15	7	340%	
K	8	30	19	7	2	66	29	7	6	340%	
N	3	47	2	9	3	64	27	26	8	n/a <sup>c</sup>	
D	2	18	3	1	8	32	13	7	<5	967%	
L	4	15	8	0	1	28	8	11	<5	-56%	
G	3	16	3	2	2	26	12	6	5	136%	
Total	46	254	112	40	31	483	189	99			

Abbreviations: HPV, human papillomavirus; Tdap, tetanus, diphtheria, pertussis.

<sup>a</sup>Childhood vaccines include hepatitis B, measles-mumps-rubella, inactivated polio vaccine, and Tdap.

<sup>b</sup>Vaccination rates are estimated based on the total student body at each school.

<sup>c</sup>School did not participate in Year 2.

of infrastructure within each school. School-located health efforts need to be flexible in design because every school has an independent culture and structure that must be respected.

We planned to gradually increase our activities throughout the summer in preparation for the back-to-school season, but summer, when school is not in session, is a difficult time to contact school personnel. Furthermore, many school personnel may not be informed of their school assignments until shortly before the start of the next academic year. School staff turnover exacerbated the challenge of establishing a streamlined communication system among Health4Chicago staff, school administrators, and community agencies, as well as a multiyear commitment to the program. With time, our Health4Chicago program is gaining name recognition among families, thus easing the process of developing new relationships.

## CONCLUSIONS

The neighborhoods in which Health4Chicago schools are located are relatively impoverished ones. Families are very mobile with frequently changing phone numbers and limited Internet access. Relying on backpack mail with adolescent students limited our ability to efficiently get information to and from parents. Effective communication with parents therefore remains a challenge. We are exploring options for Internet-based communications with families with Internet access, as well as including our information in back-to-school registration materials that parents must complete for school enrollment.

Of all vaccines promoted, the influenza vaccine was the best received. Comfort with receiving the influenza vaccine at school is likely due to the fact that receiving the influenza vaccine at nontraditional locations (pharmacies, grocery stores, workplaces) has been socially normalized. Despite certain media portrayals of the HPV vaccine, we had no overt resistance to this immunization. However, our low HPV vaccination rates could be, in part, due to parent opposition, and we are exploring this theory further in Year 4 of Health4Chicago. Local healthcare providers were not concerned that families would be less likely to establish a medical home if children are immunized at school, although this finding deserves further exploration in communities with more diversity in student payer mix.

Depending on grant funding limits the sustainability of any public health program including Health4Chicago. From the outset, we were committed to creating a financially sustainable school-located vaccination model, and

to that end we are exploring options to bill for vaccine administration and continue to maximize efficiency and minimize unnecessary overhead costs. The design and implementation of the Health4Chicago program identified several challenges that must be explored further to determine whether school-located vaccination is a viable option to improve adolescent vaccination rates nationally.

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