



# Vaccination of Children in Philadelphia for H1N1 – Comparison of School Located Vaccine Program and Health Care Provider Administration

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## Results

### Background

- The Spring 2009 H1N1 influenza epidemic disproportionately affected younger populations.
- In Fall 2009, Philadelphia Department of Public Health (PDPH) launched a comprehensive program to vaccinate children for H1N1 influenza.
  - 388 schools
  - 302 health care providers (HCPs)
- This was the 1st school located vaccination program (SLV) coordinated by PDPH.
  - 259 public, 15 private, 38 charter & 76 catholic schools
  - Primarily used live attenuated influenza vaccine (LAIV) in schools
  - 1st H1N1 doses were given in schools between mid-October and mid-December
- PDPH simultaneously administrated an adult H1N1 influenza vaccination program and a seasonal influenza vaccination program.

### Objectives

- To assess overall H1N1 vaccine coverage of 5-18 year old children in Philadelphia.
- To consider differences in the populations of children vaccinated by the SLV and HCPs.
- To compare vaccine coverage in children for H1N1 and seasonal influenza.
- To identify missed opportunities for H1N1 vaccination.

### Methods

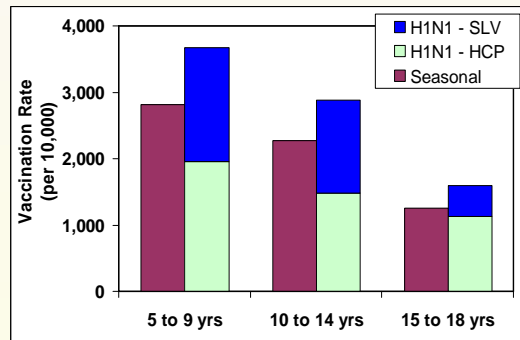
- 2009-10 influenza vaccine administration data:
  - H1N1 Influenza
    - SLV: scannable vaccine administration records (VARs) submitted by clinic staff
    - HCP: VARs or electronic submission from electronic health record (EHR)
  - Seasonal Influenza
    - Vaccination log or electronic submission from EHR or billing system
- Rate calculations based US Census Bureau statistics.
- Analysis performed in SAS 9.1.3 and ArcGIS 9.

Table: H1N1 & Seasonal Influenza Vaccine Recipients Aged 5-18 Years

	Total Population*	2009-10 H1N1 Influenza Vaccine						2009-10 Seasonal Influenza Vaccine	
		All H1N1		School Located (SLV)		Provider (HCP)*		N	% of Popn
		N	% of Popn	N	% of H1N1 1st Doses	N	% of H1N1 1st Doses		
<b>Total</b>	289,660	79,654	27.5	35,167	44.1	44,487	55.9	61,896	21.4
<b>1st Dose</b>									
5 to 9 years	101,035	37,109	36.7	17,313	46.7	19,796	53.3	28,396	28.1
10 to 14 years	96,829	27,904	28.8	13,538	48.5	14,366	51.5	22,013	22.7
15 to 18 years	91,796	14,641	15.9	4,316	29.5	10,325	70.5	11,487	12.5
<b>Female</b>	143,700	40,554	28.2	18,204	44.9	22,350	55.1	30,635	21.3
LAIV	unknown	41,613	---	34,200	82.2	7,413	17.8	not collected	
<b>2nd Dose</b>	101,035	15,767	15.6	11,853	75.2	3,914	24.8	444	0.4

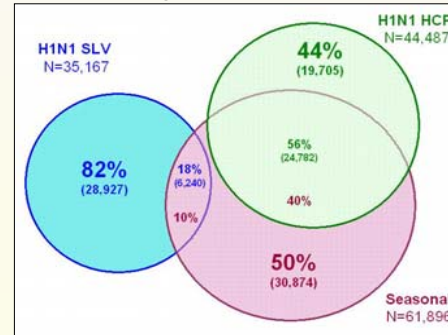
- \* Eligible population based on 2008 Census estimates.  
 \*\* Children 6 months to 9 years were eligible for 2nd dose of H1N1 vaccine. For seasonal influenza, 2nd dose is only eligible for children <9 years of age who have not already received seasonal vaccine previously.  
 \*\*\* 2,030 children who were vaccinated at HCPs had a condition reported that would contraindicate LAIV including asthma/other lung disease, pregnancy, immunocompromising conditions or treatment, neurologic disease, cardiovascular disease, or metabolic disease.  
 --- Calculated percentage of population using all 5 to 9 year olds as denominator -- not limited to <9 years or those without previous seasonal influenza doses.
- Of the approximately 290,000 5-18 year olds in Philadelphia, 28% received H1N1 influenza vaccine and 21% received seasonal influenza vaccine.
  - Slightly over half (56%) of children who received H1N1 were vaccinated by HCPs, including 2,030 children with conditions that would prevent them from receiving LAIV (see table footnote).
  - H1N1 vaccine coverage was higher than the 2009-10 seasonal influenza coverage -- overall and for each age group (see also Figure 2).
  - Of the 5-9 year old school aged children eligible for H1N1 dose 2, 16% received their 2nd dose. Most (75%) received dose 2 in school.

Figure 2: H1N1 and Seasonal Influenza Vaccination Rates



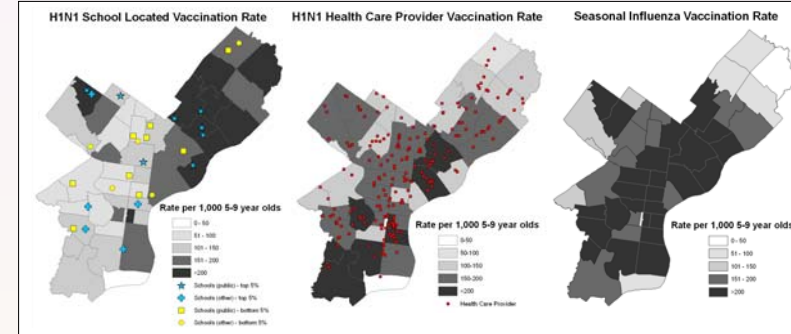
- For each age group, H1N1 vaccine coverage was higher than the 2009-10 seasonal influenza coverage (see also Table).
- Nearly half of 5-14 year olds received their H1N1 influenza vaccine in school.

Figure 3: H1N1 and Seasonal Influenza Vaccination Status for Individual Children Aged 5-18 Years



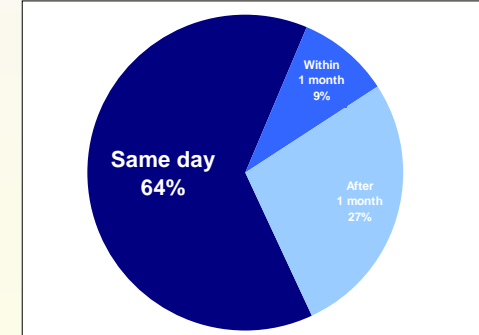
- 31,022 children received both H1N1 and seasonal influenza vaccine.
- 79,506 children were reported as having received either H1N1 or seasonal influenza vaccine, but not both doses as recommended. This represents 27% of children aged 5-18 years old.
- 56% of children who received H1N1 from their HCP and 18% of children who received school located H1N1 vaccination also received seasonal vaccine.

Figure 1: Rates of H1N1 & Seasonal Influenza Vaccination by Residential ZIP Code for 5-9 Year Olds



- H1N1 SLV had high coverage in residential ZIP codes not covered well by H1N1 HCPs.
- The SLV program also reached ZIPs with low seasonal influenza vaccination rates that often have low coverage for other vaccines (NE Philadelphia).
- There was a geographical association between H1N1 SLV coverage by residential ZIP code and school for public schools, but not for other school types (private, charter, and catholic).
- No geographical trends were observed for pediatric H1N1 HCP location and H1N1 HCP vaccination rates.

Figure 4: Time between H1N1 & Seasonal Vaccination for Children who Received Both Influenza Vaccines at HCP



- Most children (64%) who received H1N1 from their HCP received seasonal vaccine on the same day.
- Of the 9,027 children vaccinated on different days, 86% were vaccinated by the same provider on a different day.
- Of the remaining 1,247 children who were vaccinated at different locations, most received H1N1 at another pediatric practice, walk-in clinic or hospital site.

## Conclusions

- Over a quarter of children in Philadelphia were vaccinated for H1N1 during 2009-10. Nearly half of these doses were provided through the school located vaccination program.
- The H1N1 SLV and HCP programs complimented each other well. They provided coverage in very different geographic areas and even extended into areas with traditionally low vaccine coverage rates (NE Philadelphia).
- Over 10% of Philadelphia children aged 5 to 18 years received both H1N1 and seasonal influenza vaccine. Unfortunately, a large proportion of children only received one of these vaccines (27%), & over 60% did not receive either.
- Children who were vaccinated for H1N1 by HCPs were more likely to have received seasonal influenza vaccine than children who were vaccinated for H1N1 in school. However, many children were vaccinated on different days by the same provider, which represents an unnecessary cost. This could have been due to lack of H1N1 vaccine at the time of seasonal administration, inappropriate vaccine types available for co-administration (LAIV for both H1N1 and seasonal), refusal of vaccine, or simple missed opportunity.
- Further analysis will be performed to investigate whether the H1N1 influenza program was able to reach children not typically vaccinated for influenza in Philadelphia.