Interoffice Variability in the Delivery of Influenza Vaccine by US Pediatric Offices

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Background

- Since 2008, the Centers for Disease Control and Prevention Advisory Committee on Immunization Practices (ACIP) has advised that all children 6 months to 18 years of age receive annual vaccination against influenza as early as vaccine becomes available.[1]
- Children aged 6 months to 8 years may require 2 doses of influenza vaccine based on their prior vaccination status.[2]
  - Failure to receive the 2-dose regimen can lead to suboptimal protection.[3,4]
- Despite recent increases in the influenza vaccination coverage among US children, coverage still remains suboptimal.[5]
- Limited data are available regarding the current use of influenza vaccines by US office-based pediatricians.
  - An enhanced understanding of office influenza vaccination practices could help with the creation of specific, targeted interventions to improve overall vaccination rates.

Objective

- To describe pediatric influenza vaccination behaviors and delivery after the 2009 influenza pandemic response and implementation of the expanded influenza vaccination recommendations in a geographically diverse sample of US pediatricians

Methods

- A prospective observational study was conducted during the 2010–2011 influenza season using sites recruited from a random sample of licensed US pediatricians.
- In total, 105 offices tracked vaccination-related activities and influenza vaccinations given by age group in children <18 years of age; data were entered into an electronic database semimonthly from August 1, 2010, through March 31, 2011.
- Surveys at study start and completion captured patient population by age group and office demographics and characteristics.
- Vaccine coverage (percentage of children receiving ≥1 dose) and 2-dose compliance (percentage of children requiring 2 doses who received a second dose) were calculated for each study office.
- Data were analyzed with descriptive statistics.

Results

- The characteristics of all offices and children assessed in this study are presented in **Table 1**.

Table 1. Characteristics of Offices and Vaccinated Children

Characteristics	Pediatric Practice
Office	
Number of offices	105
Physicians, n (mean, range)	3.5 (1–12)
Nurses, n (mean, range)	3.5 (0–24)
Nurse practitioner/physician assistant, n (mean, range)	0.8 (0–7)
Other (mean, range)	3.1 (0–15)
Total patients, n	722,069
Pediatric patients per physician, (mean, range)	1954 (433–9982)
Electronic Medical Record, n (%)	40 (38.1)
Location within the US,* n (%)	
Northeast	18 (17.1)
South	49 (46.7)
West	19 (18.1)
Midwest	19 (18.1)
Office demographics, n (%)	
Rural	19 (18.1)
Suburban	68 (64.8)
Urban	18 (17.1)
Distribution of practices by percentage of doses from the VFC program, n (%)	
0	18 (17.1)
1–25	30 (28.6)
26–50	34 (32.4)
51–75	10 (9.5)
76–100	12 (12.4)
Offered inactivated vaccine, n (%)	105 (100)
Offered intranasal live attenuated influenza vaccine, n (%)	105 (100)
Vaccinated Children	
Age of vaccinated children, %	
6–23 mo	19.1
24–59 mo	24.4
5–8 y	24.8
9–18 y	31.7
First dose administration rate, all ages (median), %	23.8
Full vaccination rate, all ages (median), %	20.4
2-dose compliance, all ages (median), %	55.5

VFC=Vaccines for Children.
*The American Medical Association estimates that 23%, 22%, 35%, and 19% of US pediatricians reside in the Northeast, West, South, and Midwest, respectively.[6]

- Influenza vaccines were offered for a median of 239 days per year, with a median first available date of August 15, 2010, median last available date of April 11, 2011, and a median availability of 9 hours per weekday **(Table 2)**.

Table 2. Office Influenza Vaccination Practices

Office Vaccination Practices	Pediatric Practice (N=105)
Hours vaccine made available, median (range)	
Monday	9 (2–13)
Tuesday	9 (4–13)
Wednesday	9 (4–13)
Thursday	9 (2–13)
Friday	9 (2–13)
Offices offering vaccine on weekends, % (median h)	
Saturday	39.0 (3.0)
Sunday	3.8 (4.5)
Days vaccine available to patients per year, median (range)	239 (60–302)
First day, median (range)	Aug 15, 2010 (Jul 1, 2010, to Oct 15, 2010)
Last day, median (range)	Apr 11, 2011 (Dec 14, 2010, to Jun 30, 2011)
How vaccines were administered, median (range), %	
During routine health maintenance visits	40 (0–100)
At vaccine clinics during normal office hours	20 (0–100)
During sick visits	15 (0–80)
At vaccine clinics outside normal office hours	0 (0–80)
Standing order for influenza vaccine, %	62.9

- Most vaccines (40%) were administered during routine health maintenance visits, followed by clinics during normal office hours (20%), sick visits (15%), and vaccine clinics outside of normal office hours (0%; **Table 2** and **Figure 1**).
- Substantial office-level variability was observed for all outcomes **(Figures 1–3)**.
- The median overall coverage rate was 24% in children of all ages; coverage rates declined with increasing age **(Figure 3)**.
- The overall 2-dose compliance rate among those who required 2 doses was 56%; compliance rates also declined with increasing age **(Figure 3)**.

Figure 1. Office Distribution of Proportion of Influenza Vaccinations Administered by Setting

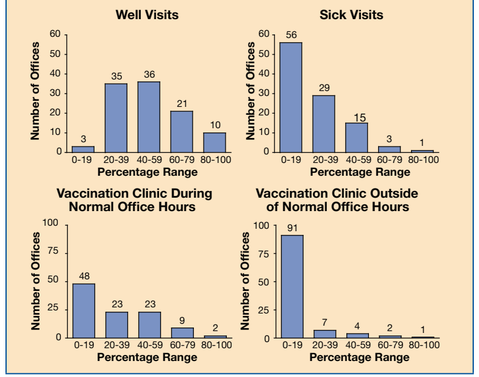
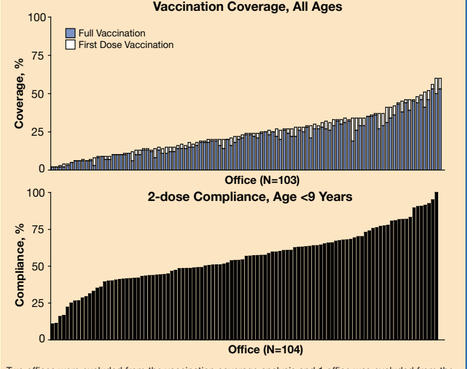
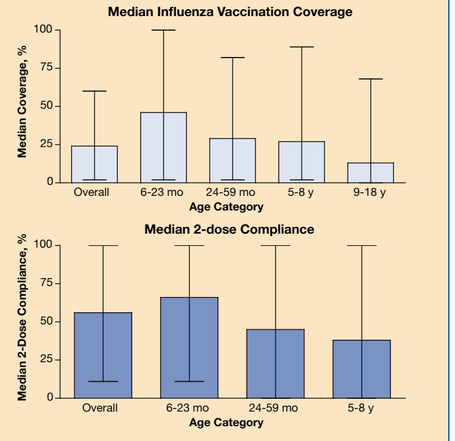


Figure 2. Vaccination Coverage and 2-Dose Compliance Rates for Eligible Children



Two offices were excluded from the vaccination coverage analysis and 1 office was excluded from the 2-dose compliance analysis.

Figure 3. Vaccination and Compliance Rates by Age



Error bars indicate range.

Conclusions

- **Among pediatric offices, there is substantial interoffice variation in the delivery of influenza vaccinations to children.**
- **A greater understanding of the techniques that pediatric offices employ to deliver influenza vaccine to children and identification of best practices could help improve pediatric influenza vaccination rates.**

References

1. Fiore AE, et al. *MMWR Recomm Rep*. 2008;57:1-60.
2. Grohskopf L, et al. *MMWR Morb Mortal Wkly Rep*. 2011;60:1128-1132.
3. Ritzwoller DP, et al. *Pediatrics*. 2005;116:153-159.
4. Neuzil KM, et al. *J Infect Dis*. 2006;194:1032-1039.
5. Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep*. 2009;58:1091-1095.
6. Smart DR. *Physician Characteristics and Distribution in the US*. Chicago, IL: American Medical Association; 2010.

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