

Smaller Pediatric Offices Have Higher In-Office Influenza Vaccination Rates

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Background

- In 2008, the Centers for Disease Control and Prevention Advisory Committee on Immunization Practices recommended that all children 6 months to 18 years of age receive annual vaccination against influenza as early as vaccine becomes available.¹
 - Recommendations included healthy children 6 to 23 months of age in 2004² and healthy children 24 to 59 months of age in 2006.³
- Because of this recommendation and the limited time available in which to deliver influenza vaccine each year, efficient delivery of influenza vaccines by office-based providers is critical.
- The majority of influenza vaccinations administered to US children are given by office-based pediatricians.⁴
- To our knowledge, no evaluations of the characteristics and activities that correlate with influenza vaccination coverage (receipt of ≥1 dose) have been performed over multiple seasons with the same methodology.

Objective

- To evaluate characteristics and activities that correlate with influenza vaccination coverage in US pediatric offices over multiple influenza seasons

Methods

- A multiyear, observational study of US outpatient pediatric offices prospectively captured influenza vaccinations by age group and activities to increase vaccine uptake during the 2007–2008 through 2010–2011 influenza seasons.
- Offices were recruited from a random sample of the American Medical Association list of pediatricians.
- Vaccination coverage was calculated as the number of children vaccinated with ≥1 dose divided by the total number of children under the office's care.
 - Offices with unexplained vaccination rates of >100% in any age group were excluded from the analysis.
- For each season, office characteristics that were correlated with office-level coverage were evaluated qualitatively and with regression analyses.

Results

- Characteristics of the 42, 84, 84, and 105 pediatric offices that participated in the study during the 2007–2008, 2008–2009, 2009–2010, and 2010–2011 influenza seasons, respectively, are presented in **Table 1**.
 - Vaccination coverage for children 6 months to 18 years of age was assessed in 36, 76, 82, and 103 pediatric offices during the 2007–2008, 2008–2009, 2009–2010, and 2010–2011 influenza seasons, respectively.
- Coverage rates increased by year and decreased by age (Figure 1).
- Across all 4 seasons, lower coverage rates were observed in offices with more children under their care.
- With each 10-fold increase in total patients, office-level vaccination coverage fell by 21% ($P<0.001$), 24% ($P<0.001$), 20% ($P<0.001$), and 24% ($P<0.001$) in each of the 4 study seasons, respectively (**Figure 2**).
- No other variable assessed (**Table 2**) was similarly correlated with coverage.

Table 1. Characteristics of Pediatric Offices and Vaccinated Children

Characteristics	2007–2008	2008–2009	2009–2010*	2010–2011
Office				
Number of offices	42	84	84	105
Physicians, mean (range), n	3.5 (1–12)	3.1 (1–9)	3.0 (1–12)	3.5 (1–12)
Nurses, mean (range), n	4.9 (0–20)	3.4 (0–17)	4.1 (0–19)	3.5 (0–24)
Nurse practitioner/physician assistant, mean (range), n	Not collected	0.6 (0–5)	0.7 (0–4)	0.8 (0–7)
Other, mean (range), n	7.8 (0–42)	5.1 (0–32)	5.9 (0–27)	3.1 (0–15)
Total patients, n	281,981	479,459	499,318	722,069
Pediatric patients per physician, mean (range), n	2342 (198–10,500)	3323 (393–13,160)	2300 (274–7018)	1954 (433–9982)
Location within the US, [†] n (%)				
Northeast	7 (17)	20 (24)	15 (18)	18 (17)
South	17 (40)	29 (35)	34 (40)	49 (47)
West	14 (33)	18 (21)	18 (21)	19 (18)
Midwest	4 (10)	17 (20)	17 (20)	19 (18)
Office demographics, n (%)				
Rural	Not collected	13 (16)	13 (16)	19 (18)
Suburban	Not collected	55 (65)	55 (65)	68 (65)
Urban	Not collected	16 (19)	16 (19)	18 (17)
Distribution of practices by percentage of doses from the VFC program, n (%)				
0	8 (19)	11 (13)	11 (13)	18 (17)
1–25	19 (45)	28 (33)	29 (35)	30 (29)
26–50	6 (14)	27 (32)	26 (31)	34 (32)
51–75	6 (14)	11 (3)	6 (7)	10 (10)
76–100	3 (7)	7 (8)	12 (14)	12 (12)
Children Vaccinated Against Influenza, %				
Age of vaccinated children				
6–23 mo	26	22	22	19
24–59 mo	27	27	26	24
5–8 y	23	25	24	25
9–18 y	24	26	27	32
First-dose administration rate, all ages, median	12	17	23	24
Full-vaccination rate, all ages, median	10	15	17	20

VFC=Vaccines for Children.

*Seasonal influenza vaccine only.

[†]The American Medical Association estimates that 23%, 22%, 35%, and 19% of US pediatricians reside in the Northeast, West, South, and Midwest, respectively.⁵

Figure 1. Influenza Vaccination Coverage by Age Group

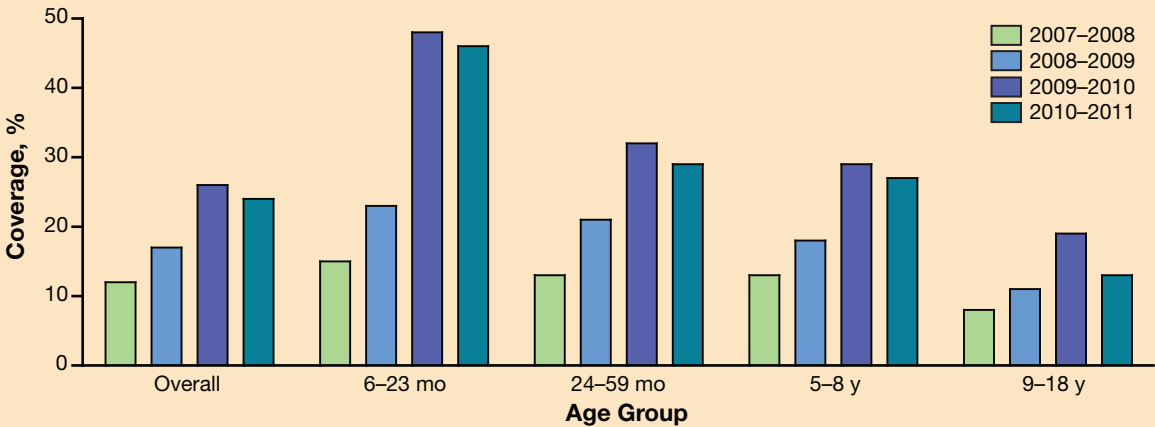


Figure 2. Correlation of Total Patients per Office With Coverage Rate

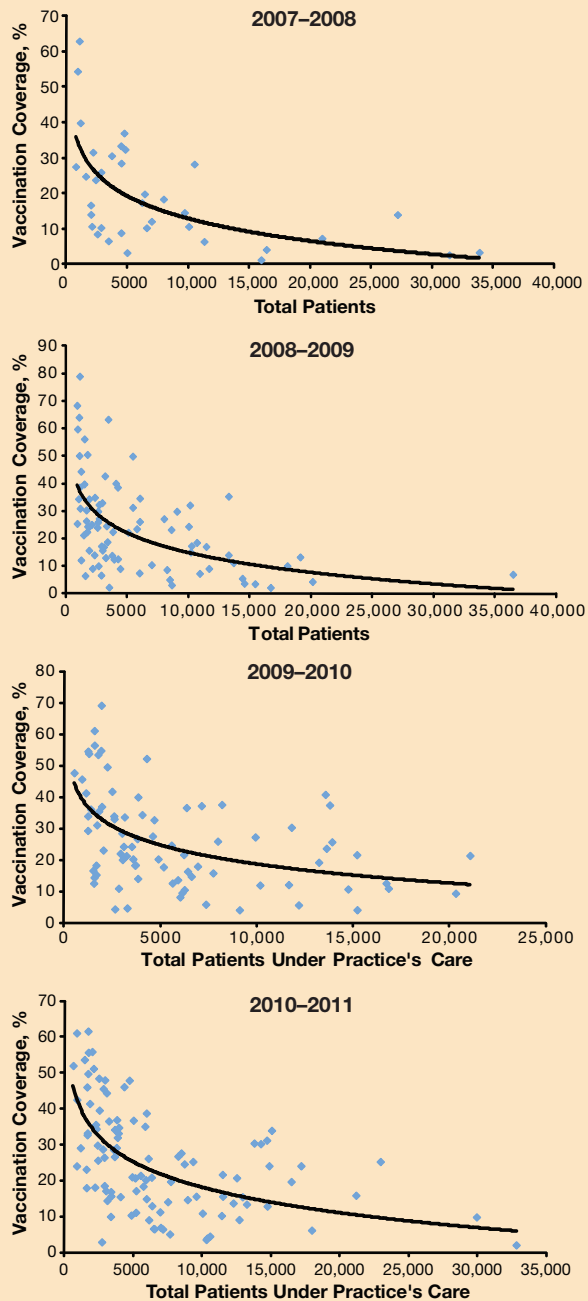


Table 2. Office Characteristics Assessed Each Season

Total number of patients
Staff/provider ratio
Staff/patient ratio
Mean physician experience (years)
Mean rating of agreement with ACIP vaccination recommendation
Percentage of office staff vaccinated
Geographic setting (urban, rural, suburban)
Percentage of vaccines administered during sick visits
Percentage of vaccines administered in clinics during normal office hours
Percentage of vaccines administered in clinics outside of normal office hours
Percentage of vaccine supplied by VFC
Percentage of vaccine reimbursed as cash
Duration vaccine was available to patients
Number of days vaccine was administered before October 1, 2010
Number of days vaccine was administered after November 30, 2010
Total hours per week of vaccine availability
Percentage of vaccine administered as preservative free single doses
Percentage of vaccine administered as intranasal vaccinations
Standing order for vaccine administration
Family member offered vaccination (yes/no)
Presence of local influenza vaccination activities
Local media coverage of influenza
Staff education workshops/speakers during influenza season
Internal benchmarking of staff vaccination rates
Study site participated in previous study years (returning site)
Number of vaccine shipments
Handed out reading material, poster, or flyers
Played televised reminders in office/waiting room
Offered incentives to patients
Mailed/phoned reminders to patients
Provided recorded messages while on hold
E-mailed reminders to patients
Computer-prompted vaccination reminders to providers

ACIP=Advisory Committee on Immunization Practices; VFC=Vaccines for Children program.

Conclusions

- Larger offices appear to be disadvantaged in delivering influenza vaccine to their patients, perhaps because of less inherent “surge-capacity” during vaccination season.**
- Larger offices should consider steps to enhance their vaccination efforts to overcome this barrier.**

References

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