



MedImmune

What Do Children Know About Influenza and Influenza Vaccines?

Kellie J. Ryan, MPH,¹ Matthew D. Rousculp, PhD, MPH,¹ Emuella M. Flood, BA,² Stan L. Block, MD,³ Matthew C. Hall, MD,⁴ Victoria M. Divino, BA,² Seth L. Toback, MD¹

¹MedImmune LLC, Gaithersburg, MD; ²Oxford Outcomes, Bethesda, MD; ³Kentucky Pediatric Research, Bardstown, KY; ⁴Marshfield Clinic, Marshfield, WI

For additional information, please contact Matthew D. Rousculp, PhD, MPH (RousculpM@MedImmune.com)

Introduction

- In 2009, the Advisory Committee on Immunization Practices (ACIP) expanded their recommendations for annual influenza vaccine to include school-aged children through 18 years of age.¹
- Influenza vaccination rates are suboptimal in children, especially among those older than 5 years. During the 2008–2009 influenza season, the Centers for Disease Control and Prevention reported on influenza vaccination coverage in 19 states and found that among children coverage estimates were 40.9% for children ages 6–23 months, 32.0% for children 2–4 years, and 20.8% for children and adolescents 5–17 years of age.²
- For eligible children 2 years or older in the United States, influenza vaccine is available as an intramuscular injection or an intranasal spray.
- Little is known about children's knowledge and perceptions of influenza and influenza vaccines.
- Assessing school-aged children's knowledge and perceptions regarding influenza and influenza vaccines and the importance they place on avoiding influenza may help increase vaccination coverage.

Objective

- The objective of this study was to explore knowledge, experiences, and perceptions of influenza and influenza vaccines among children 8–12 years of age.

Methods

- A Web survey was developed based on literature review, clinician input, and qualitative research involving 1-on-1 in-person interviews with children 6–12 years of age in the Washington, DC, area.
- Children aged 8–12 years completed the survey from August through September 2009. Child participants were identified through their parents who were sampled from a nationwide online panel, KnowledgePanel® (Knowledge Networks, Inc., Cranford, NJ), which includes over 40,000 US residents.
- The survey assessed children's experiences and perceptions of influenza and influenza vaccine.
- Institutional review board approval was obtained before study initiation. Parent participants answered a few background questions about their children and provided informed consent before children began the survey. Children 12 years of age provided informed assent before completing the survey.
- Statistical Analysis Software (SAS), Version 9.0 (SAS Institute, Cary, NC), was used for the analysis. Frequencies and descriptive statistics were calculated for all variables. Differences between subgroups (age of child [8–10 vs 11–12 y], sex, race/ethnicity, and household income) were examined using Pearson χ -square test.

Results

Child and Parent Characteristics

- 544 children between 8–12 years of age participated. The sample included approximately equal numbers of boys and girls and was equally stratified by age. Sample characteristics of parents who provided consent and child participants can be found in **Tables 1 and 2**, respectively.

Table 1. Parent Sociodemographic Characteristics (N=544)

Characteristics	n (%)
Age, y	
Mean (SD)	41.2 (6.97)
Median	41
Minimum, Maximum	25, 70
Sex, n (%)	
Men	193 (35.5)
Women	351 (64.5)
Racial/ethnic background, n (%)	
White, non-Hispanic	410 (75.4)
Black, non-Hispanic	46 (8.5)
Other, non-Hispanic	24 (4.4)
Hispanic	53 (9.7)
2+ races, non-Hispanic	11 (2.0)
Highest level of education completed, n (%)	
Less than high school	18 (3.3)
High school	108 (19.9)
Some college	116 (21.3)
Associate's degree	59 (10.9)
College degree	148 (27.2)
Graduate degree	95 (17.5)
Current employment status, n (%)	
Working	409 (75.2)
Not working, looking for work	35 (6.4)
Not working, other	76 (14.0)
Not working, retired	1 (0.1)
Not working, disabled	23 (4.2)
Household income, n (%)	
<\$30,000	58 (10.7)
\$30,000–\$59,999	154 (28.3)
\$60,000–\$99,999	192 (35.3)
≥\$100,000	140 (25.7)

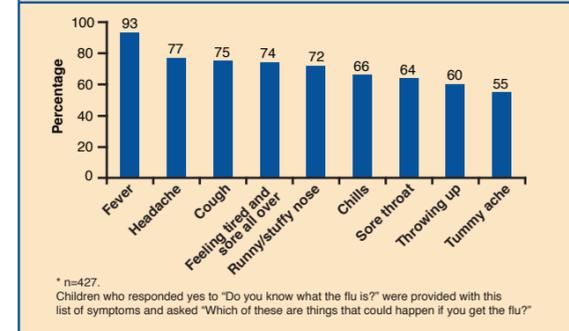
Table 2. Child Sociodemographic Characteristics (N=544)

Child Characteristics	n (%)
Age, y	
8	104 (19.1)
9	113 (20.8)
10	112 (20.6)
11	109 (20.0)
12	106 (19.5)
Sex	
Boys	277 (51.0)
Girls	266 (49.0)
Racial/ethnic background	
White, non-Hispanic	401 (74.1)
Black, non-Hispanic	44 (8.1)
Other, non-Hispanic	19 (3.5)
Hispanic	41 (7.6)
2+ races, non-Hispanic	36 (6.7)

Children's Knowledge of Influenza

- Almost all children were familiar with the term "flu" (95%), and 78% of the sample reported knowing what the flu is. More children aged 11–12 years reported knowing what the flu is compared with 8- to 10-year-olds (88% vs 80%, $P=0.0125$).
- Children who responded that they had knowledge of the flu were asked to select symptoms from a predefined list that they believed could be caused by influenza. The most commonly selected symptoms were fever (93%), headache (77%), cough (75%), and feeling tired and sore all over (74%; **Figure 1**).
- Selection of symptoms did not vary by age. A few differences regarding influenza symptoms were found by race/ethnic background, with white children being more likely to select the following symptoms than nonwhite children: headache (79% vs 69%, respectively; $P=0.0387$), tummy ache (59% vs 43%, $P=0.0026$), and throwing up (63% vs 50%, $P=0.0008$).

Figure 1. Percentage of Children Identifying the Symptom as Being Caused by Influenza*



Experience and Perceptions of Influenza

- Half the sample reported having had the flu in the past, 34% reported they never had the flu, and 16% were not sure.

Influenza Severity

- Most children thought the flu was severe. When asked "How bad is the flu?" 54% and 39% chose "pretty bad" and "really bad," respectively (**Figure 2**). 42% of the children reported that death was the "worst thing that could happen to a kid who gets the flu" (**Figure 3**).

Figure 2. Children's Perception of Influenza Severity

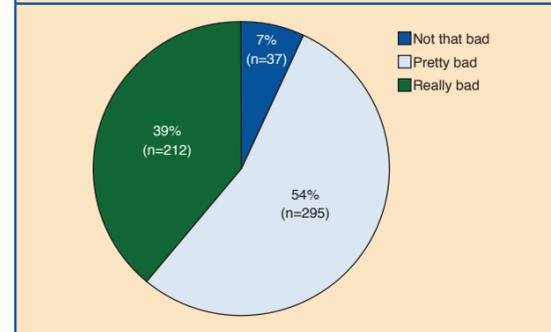
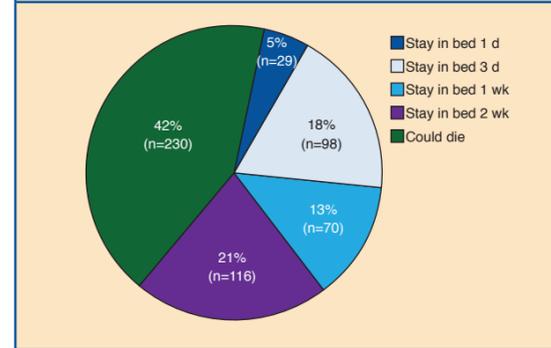


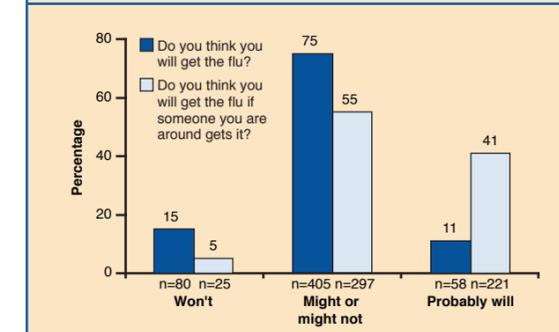
Figure 3. Children's Perception of the Worst Potential Outcome for a Child Who Gets the Flu



Susceptibility to Influenza

- When asked "Do a lot of kids get the flu?" most children (70%) responded that "some kids get the flu," 19% responded that "most kids get the flu," and 11% responded that "few kids get the flu." Nonwhite children were more likely to respond "most kids get the flu" compared with white children (30% vs 15%, respectively).
- Most children considered themselves moderately susceptible to influenza: 75% responded "I might or might not get the flu," whereas 15% responded "I won't get the flu" and 11% responded "I probably will get the flu" (**Figure 4**).
- Children were generally aware that influenza is a contagious illness. When asked about the likelihood of getting the flu if they are around someone with the flu, 41% indicated that they would "probably" get the flu (compared with 11% who generally indicated such) (**Figure 4**).

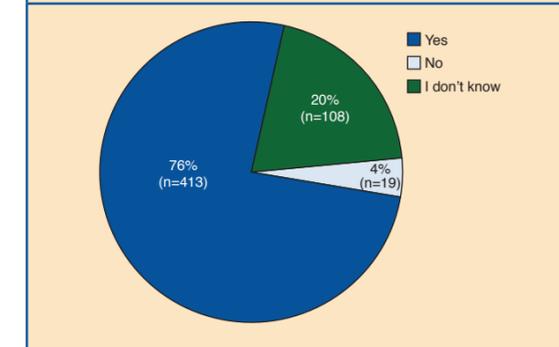
Figure 4. Children's Perceptions of Their Susceptibility to Influenza



Perceptions of Influenza Vaccine

- Most children (77%) responded that getting influenza vaccine is a good idea, 20% were not sure, and 4% said influenza vaccine is not a good idea (**Figure 5**).

Figure 5. Children's Perception of Whether or Not Influenza Vaccine Is a "Good Idea"

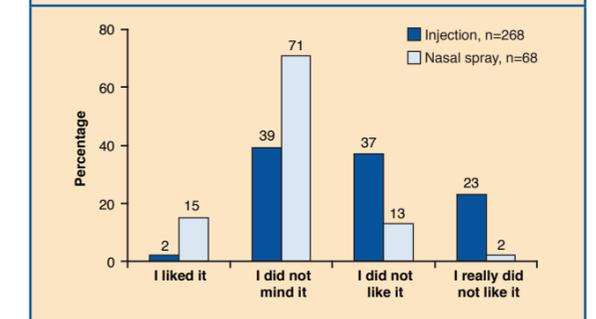


Experience With Influenza Vaccine

- More than half of the participants (55%) reported having received influenza vaccine, 30% said they had not received it, and 15% were not sure.
- More boys than girls reported that they had received influenza vaccine (60% vs 49%). White children were less likely to report that they had received influenza vaccine compared with children in other racial/ethnic categories (51% vs 66%).
- Among children who had received influenza vaccine, 75% reported having received it as an injection only, 8% reported receiving it as a nasal spray only, and 15% reported receiving it both as an injection and a nasal spray.

- Among children who had received influenza vaccine as an injection, 39% "did not mind it," 37% "did not like it," and 23% "really did not like it." Of the children who had received the nasal spray, 71% "didn't mind it," 13% "did not like it," and 2% "really did not like it" (**Figure 6**).

Figure 6. Children's Experience With Influenza Vaccines by Vaccine Type



- Children who received influenza vaccine were shown a list of adverse events and asked if they had experienced any of them after receiving the vaccine.
- 69% of children who received the vaccine via injection reported that their arm was sore, 21% could not remember any adverse effects, 10% felt tired and sore all over, and 6% reported having a fever.
- 59% of children who received the vaccine via nasal spray did not remember any adverse effects, 22% reported a runny/stuffy nose, and 7% reported feeling tired and sore all over.

Children's Knowledge and Perception of Swine Flu

- Almost all children (95%) reported they had heard of swine flu, and almost half (47%) of these children responded that they were worried about getting swine flu.

Conclusions

- Many children understood that influenza is a potentially serious illness, and the majority recognized the importance of getting an influenza vaccine and considered it a "good idea."
- The study results suggest that children may be informed participants in influenza prevention and should be included in vaccination discussions.
- In our sample, a greater proportion of children who received influenza vaccine as a nasal spray reported a positive or neutral experience compared with children who received the influenza vaccine as an injection.

References

- Fiore AE, et al. *MMWR Recomm Rep*. 2009;58:1-52.
- Centers for Disease Control and Prevention. *MMWR Morb Mortal Wkly Rep*. 2009;58:1091-1095.

This study was conducted with and on behalf of MedImmune, LLC.