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Childhood Immunizations: First-Time Expectant Mothers' Knowledge, Beliefs, Intentions, and Behaviors

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Abstract

Introduction—This study focused on how first-time mothers decide or intend to decide with respect to the recommended childhood immunization schedule.

Methods—This was the baseline survey of a larger longitudinal survey. Data were collected between June and September 2014 from 200 first-time mothers in their second trimester of pregnancy to examine vaccine-related knowledge, perceptions, intentions, and information-seeking behavior.

Results—Data were analyzed between January and June 2015. Seventy-five percent planned to have their child receive all the vaccinations consistent with the recommended childhood immunization schedule. Although participants expressed interest in childhood vaccine information, most had not received information directly from a primary care provider. One third reported receiving such information from their obstetrician/gynecologist but only about half of those were “very satisfied” with the information they received. About 70% indicated they were not familiar with the recommended vaccination schedule and number of routinely recommended vaccines. Familiarity with common vaccine education messages varied widely. Women who indicated they were planning to delay one or more recommended vaccinations were most likely to rely on Internet searches for childhood vaccine information.

Conclusions—Overall, respondents had relatively positive beliefs and perceptions regarding childhood vaccines, which were associated with intentions to get their newborn vaccinated as recommended. However, most who were planning to delay recommended vaccinations or were undecided relied primarily on socially available sources of vaccine information, rather than information provided by a healthcare professional. Improved access to vaccine information from healthcare professionals could foster better vaccine-related knowledge and favorably impact vaccination decisions.

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Introduction

The transition to parenthood is an exciting yet stressful time for new parents.[1] New parents have much to learn during pregnancy through the birth of an infant and in the early postpartum period. This is particularly true in the health domain, where new parents often need to acquire and assess information on a broad number of topics regarding the health and safety of their soon-to-arrive newborn, including vaccines and vaccinations.

Although recommended childhood vaccinations have led to 96%–100% declines in mortality in the U.S. for several once-common diseases, there have been recent outbreaks of vaccine-preventable diseases in the U.S. linked to unvaccinated children[2–4] (e.g., measles and *Haemophilus influenzae* Type b) and there is evidence that a number of parents are hesitant when it comes to routinely recommended vaccinations.[5–8]

A number of studies have examined the vaccine- and vaccination-related confidence, knowledge, attitudes, and beliefs of parents of young children[9–11]; however, relatively few U.S. studies have focused on new or expectant mothers, who are a group that will soon be making vaccine-related decisions.[12–17]

As few efforts have examined how pregnant women, particularly those who are pregnant for the first time, are acting or planning to act with respect to recommended childhood vaccines, that group was the focus of this research. This study, which focused on first-time expectant mothers in the U.S., built off the qualitative and quantitative research previously noted by examining:

1. self-reported immunization plans of expectant mothers for their offspring;
2. interest, familiarity, and knowledge of vaccines and the recommended childhood immunization schedule
3. vaccine-related information seeking and exposure, including primary sources to date;
4. confidence in the safety, value, and benefits of recommended childhood vaccines;
5. perceptions regarding the value and importance of routine childhood vaccines; and
6. familiarity with commonly used or provided vaccination-related messages (e.g., messages provided on websites and vaccine education materials), and whether they found the messages believable and persuasive.

Methods

Findings reported here are from the initial survey in an ongoing longitudinal study of U.S. women, with the overall study designed to assess whether and how vaccine-related knowledge, beliefs, intentions, and behaviors evolve from the second trimester of pregnancy through their child's 19th month of life. The initial survey took place when women were in

the second trimester of pregnancy (i.e., weeks 13–27) and assessed immunization-related intentions, knowledge, information seeking, and beliefs.

Procedure and Design

A commercial market research firm used its national database of 70,000 panelists to identify first-time mothers with due dates between September and December 2014. The database included representation from every state, with the representation reflecting population density. The overall panel consisted of people who expressed interest in participating in research opportunities and who had e-mail addresses and Internet access. Pregnant panel members were ineligible if they were aged <18 years, were expecting more than one baby, reported an educational level of less than high school, did not have access to a computer or mobile device, or could not easily read, speak, or understand English. As one of the main purposes of the study was to look at the evolution of vaccine-related information-seeking behaviors over time among women who are accepting vaccination, mothers were excluded if they had already decided that their child would not receive any vaccines.

The goal for the overall longitudinal study was to have at least 100 women complete all seven surveys, and it was assumed that achieving that would require 200 participants for the first survey (i.e., this would accommodate a 50% attrition rate). The recruitment involved contacting eligible women and inviting them to participate in the overall study until the desired sample size was achieved. Achieving a sample of 200 women required contacting 242 eligible women. Participants received an introductory letter and a web link to the first survey. Three reminders were sent using e-mail and telephone. Written informed consent was not required because the study presented minimal risk; instead, consent was obtained through participation in the survey. Respondents could opt out of the survey at any time as well as opt out of future surveys. Respondents received $30 for completing the survey. Data for Survey 1 were collected between June and September 2014. The IRB of the Oak Ridge Associated Universities approved the study; CDC and the National Vaccine Program Office deferred to the Oak Ridge Associated Universities IRB.

Survey Instrument

The survey instrument was developed using or adapting existing questions whenever possible. Along with demographic information, respondents were asked about: knowledge and familiarity with the recommended childhood immunization schedule; vaccination intentions for their child; confidence in the safety, effectiveness, and benefits of recommended childhood vaccines (using 1–5 scales, where 1 was *not at all confident* and 5 was *very confident*); vaccine-related communication with their prenatal healthcare professional; and vaccination information interest and seeking (including whether they had selected a pediatrician and whether immunization intentions factored into pediatrician selection). Respondents also were asked a series of agree–disagree statements related to the importance of recommended vaccines and following the recommended immunization schedule, followed by a three-part series of questions involving 12 commonly used or provided vaccine-related educational messages or statements (Table 1). This part of the study was designed to assess whether expectant mothers had heard or read commonly

provided vaccine-related messages, whether they believed the messages, and whether the message would influence their vaccination intentions.

Statistical Analysis

Data were analyzed between January and June 2015. Descriptive statistics were calculated using SPSS, version 21. When sample sizes allowed, comparisons were made among mothers who intended to vaccinate as recommended, mothers who planned to delay or forego one or more recommended vaccinations, and mothers who were uncertain regarding their child's vaccination.

Results

The first-time expectant mothers ranged in age from 19 to 44 years (mean=28 years, SD=5.2 years). Twenty-two participants (11%) reported at least one older child in their household, but all indicated this was their first pregnancy. As Table 2 illustrates, most were non-Hispanic white, married, and employed full time. About 41% graduated from college (including 19% with an advanced degree). Respondents reflected a range of household incomes, with about 36.5% reporting incomes of ≥$75,000 a year. The vast majority reported having private health insurance. Most respondents (71.5%) indicated decisions about healthcare for their child would be made jointly with their spouse or partner. At this stage of their pregnancy, 37.5% said they had identified a pediatrician or family doctor for their child.

Seventy-five percent of expectant mothers planned to have their child receive all of the vaccinations recommended by their child's doctor or nurse as scheduled, whereas 10.5% planned to have their children receive all but with some being delayed or spaced out. Another 4% indicated they planned to have their child receive some but not all of the recommended vaccinations and 10.5% had not yet decided their vaccination plans (Table 3). Consistent with the inclusion criteria, no mother indicated that her child would receive none of the recommended childhood vaccinations. When asked how important a doctor's willingness to be *flexible regarding which vaccines their child receives* was or would be a factor in selecting a pediatrician or family doctor for their child, over half indicated it would be *important* (23.0%) or *very important* (36.5%). The mothers gave similar responses when asked how important a doctor's willingness to be *flexible regarding the vaccine schedule* would be in selecting a pediatrician or family doctor for their child; about 60% said it would be *important* (25.0%) or *very important* (34.5%).

Based on their vaccination intentions, respondents were divided into three groups (i.e., *Acceptors* said their child would *receive all as recommended, Delayers/Decliners would space out or delay or get some but not all*, and *Undecideds* were unsure about their vaccination plans). There were no demographic differences across the three groups. Delayers/Decliners, however, had the highest average importance rating with respect to a doctor's willingness to be flexible regarding vaccines when selecting a pediatrician or physician for their child (4.48 of 5) compared with 3.44 for vaccine Acceptors ($p<0.01$).

Vaccine Interest, Familiarity, and General Knowledge

About half of the expectant mothers (48.5%) were very *interested* in childhood vaccines, and 47.5% indicated they were *somewhat interested*. Most characterized their current knowledge regarding childhood vaccines as *good* (33.7%) or fair (35.7%), but 14.6% characterized it as *poor*. Familiarity with the recommended childhood immunization schedule did not appear as high; only 29.5% indicated they were *very familiar* (8.0%) or *familiar* (21.5%) with the schedule. Approximately 7% said they did not know there was a schedule. Undecideds reported the lowest level of familiarity with the recommended vaccination schedule (mean=2.24, SD=0.89), with the difference being statistically significant compared with Acceptors (mean=3.11, SD=1.01, $p<0.001$).

Few of the expectant mothers were satisfied with their current level of knowledge regarding childhood vaccines: 6% said they were *very satisfied*, whereas 42.0% were *very* (16.0%) or *somewhat* (26.0%) dissatisfied with their current knowledge level. About two thirds (63.5%) indicated they had not received any information on childhood vaccines from their obstetrician/gynecologist (OB/GYN) or midwife. Of the 73 expectant mothers who had received vaccine information from their OB/GYN or midwife, 15.5% said they were *very satisfied* with the information.

Nearly all of the mothers-to-be believed parents should ask questions about the safety as well as the importance or value of their child's vaccinations. With respect to safety, 79.3% *strongly agreed* and 15.2% agreed with asking questions about safety, and 80.9% *strongly agreed* and 13.6% *agreed* regarding value or importance.

In the past month, 38% said they had not tried to find any information, 33.5% said they sought *a little* and 21.5% said *some*. Only 7% reported trying to find *a lot* of information. Expectant mothers were asked: *In the past month, what were your three most important sources of information about childhood vaccines?* As Table 4 shows, of the 112 women who were asked or responded to the question, an Internet search engine (e.g., Google, Yahoo) was the most commonly cited information source (36%), followed by family (27%) and healthcare professional(s) (e.g., primary care professional or OB/GYN) (22.5%). There were differences between Acceptors, Delayers/Decliners, and Undecideds with respect to important sources of information about childhood vaccines. The top three information sources for Acceptors were Internet search engines (32.7%), their healthcare provider (e.g., OB/GYN or other primary care professional) (26.7%), and family (26.0%). Delayers/Decliners used Internet search engines (58.6%) and family (34.5%), with online pregnancy or parenting sites third (31.0%). Undecideds' top vaccine sources were Internet search engines (28.6%) and family (23.8%); Internet health sites (19%) and parenting blogs (19%) tied for third most important information source(s).

As shown in Table 3, most had relatively high confidence ratings for routine childhood vaccines, with the highest ratings being associated with vaccine effectiveness. Overall, 81.4% indicated they were *confident* or *very confident* in the effectiveness of routine childhood vaccines (mean=4.22, SD=0.90); 78.4% were *confident* or *very confident* in the value of routine childhood vaccines (mean=4.23, SD=0.94); and 73.5% were *confident* or *very confident* in the safety of routine childhood vaccines (mean=4.02, SD=1.02). There

were statistically significant differences among Acceptors, Delayers/Decliners, and Undecideds with respect to the vaccine confidence measures. Acceptors had higher confidence in the effectiveness of routine childhood vaccines compared with both Delayers/Decliners (mean=4.45 vs mean=3.83, $p<0.001$) and Undecideds (mean=4.45 vs mean=3.10, $p<0.001$), with the difference between Delayer/Decliners and Undecideds also statistically significant. Acceptors also had the highest levels of confidence in the value and safety of recommended childhood vaccines (mean=4.51 for value and mean=4.33 for safety) compared with Delayers/Decliners (mean=3.76 for value and mean=3.38 for safety) and Undecideds (mean=2.86 for value and mean=2.62 for safety) ($p<0.001$ for all comparisons).

Nearly all the expectant mothers believed immunizations were *important* (25.0%) or *very important* (59.5%) for keeping children healthy. Similarly, 86.5% said it was *important* (20.5%) or *very important* (66.0%) to them that their baby receives all recommended vaccinations. For all three items, Acceptors had the highest importance ratings (mean=4.69 for keeping children healthy, mean=4.76 for receiving all recommended vaccines, and mean=4.71 receiving them according to the schedule), with statistically significant differences in all cases from Undecideds (mean=3.19, 3.43, and 3.29, respectively, $p<0.001$) and Delayers/Decliners (mean=3.76, 3.72, and 3.34, respectively, $p<0.001$).

In terms of likelihood that their child could get a serious vaccine-preventable disease if not vaccinated, 45.5% of the expectant mothers said *likely* (27.5%) or *very likely* (18.0%). Most (84.4%) also *strongly agreed* (60.3%) or *agreed* (24.1%) that getting their child vaccinated was the right thing to do.

Self-reported familiarity with commonly provided vaccination-related messages was generally high for most items (Table 1). However, even though all the statements are true, not all the mothers-to-be perceived them as such. About one third (36%) of the expectant mothers did not believe *A baby's immune system can handle several vaccines at one doctor's visit*, and about a fourth (23.5%) did not believe *Scientific studies and reviews show no relationship between vaccines and autism*. Conversely, high percentages of expectant mothers indicated they believed most of the statements, with some of the highest belief levels being associated with statements that many had indicated they had not previously seen or heard. For example, 88.5% believed *The recommended immunization schedule is designed to protect infants and children by providing immunity early in life, before they are exposed to life-threatening diseases* (63% reported previously heard or read) and 83% believed *Vaccines give infants and young children the best protection from 14 serious diseases* (48% previously heard).

All 12 statements were perceived as having the potential for positively impacting expectant mothers' vaccination plans, but some were rated much higher than others (Table 1). The responses also suggested that for many, statements focused on vaccine side effects and reactions were ranked as having somewhat less impact, including being characterized by 20%–25% as ones that would not influence their plans (e.g., *Most vaccine side effects are very minor, like soreness where the shot was given, fussiness, or a low-grade fever*). Relatedly, the statement *A baby's immune system can handle several vaccines at one visit* turned out to be the statement that had the lowest levels of awareness, believability, and

influence, with 10% indicating it could potentially decrease the likelihood of vaccinating their baby.

Discussion

Overall, this study found most expectant mothers in the second trimester of pregnancy had positive beliefs and perceptions regarding childhood vaccines, and those were associated with intentions to get their newborn vaccinated as recommended. Acceptors, or parents who were planning to have their child vaccinated as recommended, had the highest ratings when it came to the importance of vaccines for keeping their children healthy. They also believed it very important for their baby to receive all of the recommended vaccines according to the recommended schedule. When it came to vaccine confidence, it was Acceptors who also had the highest ratings with respect to confidence in the effectiveness, value, and safety of recommended childhood vaccines, with their confidence levels similar to those found in studies involving parents of children aged 6 years and younger who had already or were currently making vaccine decisions for their children.[6–11] Together, these findings strongly suggest that perceptions regarding the importance of childhood vaccines, confidence in childhood vaccines, and vaccination intentions are highly interrelated. However, the findings also indicated that even among the most supportive and confident expectant mothers, many would value primary care providers who are willing to be flexible with regard to recommended vaccinations.

In line with that, the findings provide direction when it comes to vaccination education efforts, particularly with first-time expectant mothers. First, healthcare providers should recognize that high stated interest in vaccines should not be taken as an indication of high familiarity or active information seeking. Although around half indicated they were *very interested* in childhood vaccines, only 7% stated they had sought out *a lot* of information. Rather, two thirds characterized their vaccine information seeking efforts to date as little to none. Second, though most mothers characterized their vaccine-related knowledge as *fair* or *good*, satisfaction levels indicated there is need and room for improvement. Some also lacked specific knowledge—for example, not being aware that some vaccine preventable diseases remain common in the U.S., that vaccines protect children from 14 diseases, or that a baby's immune system could handle several vaccines at one visit. Of note, Undecided expectant mothers reported the lowest familiarity with the immunization schedule as well as the lowest confidence ratings. For some, it may be their unfamiliarity with the schedule that has created indecision. For others, it is likely they have yet to be convinced of the importance of vaccines for keeping children healthy.

Finally, and in line with previous studies,[18,19] the findings provide support for expanded efforts to provide vaccine-related information to expectant mothers. Most appeared to be receptive to such information and relatively few were receiving it from OB/GYNs, mid-wives, or physicians. Even though infant immunizations are outside an OB/GYN or midwife's scope of practice, results here suggest finding or creating ways to assist OB/GYNs and midwives in directing expectant mothers to vaccine and receiving immunization information from other reliable and trusted sources could help strengthen vaccine education

efforts and promote immunization. Although expectant mothers may use many sources, most may place a higher value on sources recommended by their OB/GYN or midwife.[7,10,17]

Limitations

Several limitations could affect the conclusions and generalizability of this study. First, though the database used to recruit expectant mothers included representation from all states, the overall database was not designed to be nationally representative. This did allow the study to go beyond the single healthcare system or state used in most studies involving expectant mothers, but the database population from which the recruitment took place was a self-selected group, all of whom had Internet access and an e-mail address and had indicated a willingness to participate in research projects. Another limitation is the overall sample size. Although 200 mothers provide a fairly robust sample, there were relatively small percentages of Delayers/Decliners and Undecideds. As a result, many subgroup analyses were not possible or may have failed to show differences because the statistical power was too low. However, the numbers here do reflect what has been seen in other surveys (i.e., small numbers of these parents in the sample because there is a relatively small number of them in the population). A third limitation is that, per the IRB protocol, participants were allowed to skip questions they did not want to answer. A relatively high percentage skipped questions regarding awareness and believability of vaccine-related messages, possibly because of the burden of reading and interpreting a list of statements. A fourth limitation is the exclusion of expectant mothers who said they did not plan to vaccinate their child. Although this means that over time the authors will only be able to measure change among people who are accepting of vaccines, this study would likely have included too few non-vaccinators to analyze as a separate subgroup (e.g., the most recent estimates from CDC's National Immunization Survey found less than 1% of children aged 19–35 months received no vaccinations).[20] The self-report nature of the data is a fifth limitation, particularly with respect to making projections regarding the future, including vaccination of a yet-to-be born child. It is possible many of these women will change their plans regarding vaccines as the time for getting their child vaccinated gets closer. They will likely be hearing and reading more things as well as learning from the actual vaccination experience— which may or may not match their expectations. It is because of this possibility that this survey is part of a larger longitudinal study.

Conclusions

This study provides many insights into how first-time mothers, who are in the second trimester of pregnancy, perceived recommended routine childhood vaccinations. Findings reinforced the social norm that most intended to vaccinate their soon-to-be born child as recommended and had high confidence in the effectiveness, value, and safety of childhood vaccines. Most expressed interest in vaccine information but were not active information seekers and relatively few had received vaccine information from someone directly involved in their care. Though many were familiar with the benefits of vaccines, more proactive efforts by healthcare providers with first-time mothers during pregnancy could foster stronger understanding of vaccination recommendations and improved protection of children against preventable diseases.

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Table 1

Awareness, Assessment, and Influence of Frequently Provided Vaccine Messages

	Have you heard or read this statement before taking this survey?			Do you think the statement is true or false?			How does each statement influence your plans for vaccinating your baby?					
Statement	Have seen or heard %	Have not seen or heard %	Not answered %	True %	False %	Not answered[a] %	Much more likely %	Somewhat more likely %	Does not influence %	Somewhat less likely %	Less likely %	Not answered[a] %
Vaccines prevent potentially deadly diseases.	75.5	11.0	13.5	87.5	6.5	6.0	65.0	22.5	9.0	2.0	0.5	1.0
Most vaccine side effects are very minor, like soreness where the shot was given, fussiness, or a low-grade fever.	75.5	14.0	10.5	86.5	4.5	9.0	34.5	38.5	20.5	4.5	2.0	0
The benefits from vaccines outweigh the risks.	74.5	12.5	13.0	85.0	7	8.0	51.0	30.5	14.0	3.0	0.5	1.0
Serious reactions from vaccines are rare.	69.5	22.5	8.0	78.5	10.5	11.0	38.0	27.0	26.5	6.0	2.0	0.5
Vaccines are well tested for safety.	65.5	24.5	10.0	79.5	10.5	10.0	57.5	26.0	14.0	0.5	0.5	1.5
The recommended immunization schedule is designed to protect infants and children by providing immunity early in life, before they are exposed to life-threatening diseases.	63.0	26.5	10.5	88.5	2.5	9.0	53.0	29.0	15.5	1.5	0	1.0
Vaccines help strengthen an	59.0	30.0	11.0	73.0	15.5	11.5	58.5	26.5	12.0	2.0	0.5	0.5

Statement	Have you heard or read this statement before taking this survey?			Do you think the statement is true or false?			How does each statement influence your plans for vaccinating your baby?					
	Have seen or heard %	Have not seen or heard %	Not answered %	True %	False %	Not answered[a] %	Much more likely %	Somewhat more likely %	Does not influence %	Somewhat less likely %	Less likely %	Not answered[a] %
infant's immune system.												
Getting my baby vaccinated also protects other children who are too young or too sick to be vaccinated themselves.	57.5	30.5	12.0	73.5	17.0	9.5	49.5	30.5	18.0	2.0	0	0
Some vaccine-preventable diseases remain common in the United States.	54.0	26.5	10.0	77.0	11.5	11.5	52.0	23.0	21.5	2.0	1.0	0.5
Vaccines give infants and young children the best protection from 14 serious diseases.	48.0	42.0	10.0	83.0	5.5	11.5	57.5	28.5	13.0	0.5	0	0.5
Scientific studies and reviews show no relationship between vaccines and autism.	46.5	45.5	8.0	62.0	23.5	14.5	43.0	26.5	25.0	4.5	0.5	0.5
A baby's immune system can handle several vaccines at one doctor's visit.	34.5	57.0	8.5	53.5	36.0	10.5	32.0	26.5	30.5	9.0	1.5	0.5

[a]The “Not answered” column may include respondents who did not answer the first question in the three-question series.

Table 2
Expectant Mothers' Demographic Characteristics (N=200)

Variable	%
Ethnicity	
Hispanic or Latina	13.4
Not Hispanic or Latina	86.6
Race	
White/Caucasian	74.6
Black or African American	11.7
American Indian or Alaska Native	1.0
Asian	7.6
Other	5.1
Marital status	
Married or partnered	77.0
Divorced or separated	0.5
Single	22.5
Highest education	
Advanced degree	19.0
Four-year degree	22.5
Two-year degree	11.0
Some college or technical school	29.0
High school or GED	17.5
Less than high school	0.5
Other	0.5
Occupational status	
Employed full-time	55.8
Employed part-time	15.6
Unemployed	17.1
Stay-at-home parent	6.5
Student	3.5
Other	1.5
Annual income	
Less than $25,000	23.0
$25,000–$49,9999	21.5
$50,000–$74,999	12.5
$75,000–$100,000	17.0
More than $100,000	19.5
I did not want to answer question	6.5
Insurance status	
Private	66

Variable	%
Medicare/Medicaid	31
None	3

GED, general educational development.

Table 3
Intentions, Familiarity, Confidence, and Perceived Importance of Childhood Vaccines

Which of the following best describes your plans for vaccinating your baby?		**Yes %**
I plan to have my child receive all of the vaccinations recommended by his/her doctor or nurse as scheduled.		75.0
I plan to have my child receive all the vaccinations recommended by his/her doctor or nurse but will space out or delay them.		10.5
I have not decided yet about plans for vaccinating my baby.		10.5
I plan to have my child receive some but not all of the vaccinations recommended by his/her doctor or nurse.		4.0
I intend to have my child receive none of the vaccinations recommended by his/her doctor or nurse.		0
How familiar are you with the recommended childhood vaccine schedule?		%
I didn't know there was a schedule		6.5
Not familiar		27.5
Neutral		36.5
Familiar		21.5
Very familiar		8.0
How confident are you…	**Total %**[a]	**M (SD)**[b]
in the effectiveness of routine childhood vaccines?	81.4	4.22 (0.90)
in the value of routine childhood vaccines?	78.4	4.23 (0.94)
in the safety of routine childhood vaccines?	73.5	4.02 (1.02)
How important…	**Total %**[a]	**M (SD)**[b]
to you is it that your baby receives all of the vaccines recommended for him/her?	86.5	4.47 (0.88)
do you think immunizations are for keeping children healthy?	84.5	4.40 (0.87)
is it to you that your baby receives vaccines according to the recommended schedule?	83.5	4.37 (0.95)

[a]"Total %" column represents responses that were either a "4" or a "5" on a 1–5 scale, where 1 was *not at all confident* and 5 was *very confident*.

[b]"M (SD)" column represents the mean and standard deviation for the each *importance* item (i.e., 1-5 response range).

Table 4
Top Sources for Childhood Vaccine Information

In the past month, what were your 3 most important sources of information about childhood vaccines?	%[a]
Internet search engines (e.g., Google, Yahoo)	36.0
Family	27.0
My healthcare professional (such as a primary care professional or OB/GYN)	22.5
Online pregnancy or parenting site (e.g., BabyCenter or The Bump)	19.0
Friends	17.0
Internet health site	13.5
My child's doctor	9.5
My child's other parent	7.5
Internet social media (e.g., Facebook, Twitter, message boards)	4.5
Internet news site	3.5
Parenting blogs	3.5
Apps (for smartphones or tablets)	3.0
Other source(s) (not Internet)	2.5
Traditional media (such as television, newspapers, radio, magazines, and books)	1.5
Other Internet sources	1.5
My child's nurse	1.0
Complementary healthcare professional (such as chiropractor or homeopath)	1.0

OB/GYN, obstetrician/gynecologist.

[a]Seventy-six (38%) did not answer the question because they had not looked for any information.