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

Allison Fisher, MPH

National Vaccine Advisory Committee

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National Center for Immunization & Respiratory Diseases

Health Communication Science Office

BACKGROUND AND METHODS

Background

- Vaccines are one of the most important and effective ways to protect expecting mothers and infants from a number of potentially serious infectious diseases (e.g., influenza, rubella, pertussis)

- Recommended childhood vaccinations have led to declines in mortality, yet some parents are still hesitant when it comes to routinely recommended vaccinations

- It is important to understand how first-time pregnant women act or plan to act with respect to the recommended infant and childhood immunization schedule

First-Time Expectant Mothers Survey Background

- Longitudinal study of U.S. women – goal of at least 100 women
  - Survey 1 (n=200)
- Commercial research firm used its national database of 70,000 panelists to identify first-time mothers with due dates between September and December 2014
- General descriptive analysis of Survey 1 data

RESULTS

Demographics

Age Range: 19 to 44 years (M=28 years; SD=5.2)	
	%
Race	
White/Caucasian	74.6
Black or African American	11.7
American Indian or Alaska Native	1.0
Asian	7.6
Other	5.1
Annual income	
Less than $25,000	23.0
$25,000-$74,999	34
$75,000 +	36.5
I did not want to answer question	6.5

Which of the following best describes your plans for vaccinating your baby?

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%

Which of the following best describes your plans for vaccinating your baby? - 2

How confident are you…	Total %	M (SD)
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 %	M (SD)
to you is it that your baby receives all 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)

Acceptors (n=150)

How confident are you…	Total %	M (SD)
in the effectiveness of routine childhood vaccines?	90.5	4.45 (0.68)
in the value of routine childhood vaccines?	89.9	4.51 (0.69)
in the safety of routine childhood vaccines?	86.6	4.33 (0.76)

How important…	Total %	M (SD)
to you is it that your baby receives all the vaccines recommended for him/her?	96.0	4.76 (0.51)
do you think immunizations are for keeping children healthy?	95.3	4.69 (0.56)
is it to you that your baby receives vaccines according to the recommended schedule?	96.6	4.71 (0.55)

Delayers/Decliners (n=29)

How confident are you…	Total %	M (SD)
in the effectiveness of routine childhood vaccines?	65.5	3.83 (0.97)
in the value of routine childhood vaccines?	55.1	3.76 (0.87)
in the safety of routine childhood vaccines?	41.4	3.38 (0.98)

How important…	Total %	M (SD)
to you is it that your baby receives all the vaccines recommended for him/her?	62.1	3.72 (1.10)
do you think immunizations are for keeping children healthy?	58.6	3.76 (1.02)
is it to you that your baby receives vaccines according to the recommended schedule?	48.2	3.34 (1.17)

Undecideds (n=21)

How confident are you…	Total %	M (SD)
in the effectiveness of routine childhood vaccines?	38.1	3.10 (1.09)
in the value of routine childhood vaccines?	28.6	2.86 (1.11)
in the safety of routine childhood vaccines?	23.8	2.62 (1.12)

How important…	Total %	M (SD)
to you is it that your baby receives all the vaccines recommended for him/her?	52.3	3.43 (1.21)
do you think immunizations are for keeping children healthy?	42.9	3.19 (0.98)
is it to you that your baby receives vaccines according to the recommended schedule?	38.1	3.29 (1.06)

Undecideds (n=21) - 2

How satisfied are you with your current level of knowledge regarding childhood vaccines? (%)

Very dissatisfied 16.0	*Somewhat dissatisfied* 26.0	*Neither satisfied nor dissatisfied* 21.5	*Somewhat satisfied* 30.5	*Very satisfied* 6.0

How satisfied have you been with the information your OB/GYN or midwife has given you on childhood vaccines? (%)

Very dissatisfied 1.5	*Somewhat dissatisfied* 1.0	*Neither satisfied nor dissatisfied* 9.5	*Somewhat satisfied* 9.0	*Very satisfied* 15.5	*My OBGYN or midwife has not given me any information* 63.5

Undecideds (n=21) - 3

Parents should ask questions about the safety of their child's immunizations. (%)

Strongly disagree	*Somewhat disagree*	*Neither disagree nor agree*	*Somewhat agree*	*Strongly agree*
0	*0*	*5.6*	*15.2*	*79.3*

Parents should ask questions about the importance or value of their child's vaccinations. (%)

Strongly disagree	*Somewhat disagree*	*Neither disagree nor agree*	*Somewhat agree*	*Strongly agree*
0	*0*	*5.5*	*13.6*	*80.9*

Sources for Childhood Vaccine Information

In the past month, what were your 3 most important sources of information about childhood vaccines?	%
Internet search engines (e.g., Google, Yahoo)	36.0
Family	27.0
My healthcare professional (such as a primary care professional or OBGYN)	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 of tablets)	3.0
Other source(s) (not Internet)	2.5

Sources for Childhood Vaccine Information Acceptors (n=150)

In the past month, what were your 3 most important sources of information about childhood vaccines?	%
Internet search engines (e.g., Google, Yahoo)	32.7
My healthcare professional (such as a primary care professional or OBGYN)	26.7
Family	26.0
Friends	18.0
Online pregnancy or parenting site (e.g., BabyCenter or The Bump)	16.7
My child's doctor	11.3
Internet health site	10.0
My child's other parent	7.3
Internet social media (e.g., Facebook, Twitter, message boards)	3.3
Apps (for smartphones of tablets)	3.3
Internet news site	2.7
Other source(s) (not Internet)	2.7
Parenting blogs	2.0

Sources for Childhood Vaccine Information Delayers/Decliners (n=29)

In the past month, what were your 3 most important sources of information about childhood vaccines?	%
Internet search engines (e.g., Google, Yahoo)	58.6
Family	34.5
Online pregnancy or parenting site (e.g., BabyCenter or The Bump)	31.0
Internet health site	27.6
Friends	17.2
My healthcare professional (such as a primary care professional or OBGYN)	10.3
Parenting blogs	10.3
My child's doctor	6.9
Internet social media (e.g., Facebook, Twitter, message boards)	6.9
Traditional media (television, newspapers, radio, magazines, and books)	6.9
My child's other parent	3.4
Apps (for smartphones of tablets)	3.4
Internet news site	3.4
Other source(s) (not Internet)	2.7

Sources for Childhood Vaccine Information Undecideds (n=21)

In the past month, what were your 3 most important sources of information about childhood vaccines?	%
Internet search engines (e.g., Google, Yahoo)	28.6
Family	23.8
Online pregnancy or parenting site (e.g., BabyCenter or The Bump)	19.0
Internet health site	19.0
My child's other parent	14.3
My healthcare professional (such as a primary care professional or OBGYN)	9.5
Friends	9.5
Internet social media (e.g., Facebook, Twitter, message boards)	9.5
Internet news site	9.5
Parenting blogs	4.8
Other source(s) (not Internet)	4.8
My child's doctor	0
Apps (for smartphones of tablets)	0

Frequently Provided Vaccine Messages

Vaccines prevent potentially deadly diseases.

Most vaccine side effects are very minor, like soreness where the shot was given, fussiness, or a low-grade fever.

The benefits from vaccines outweigh the risks.

Serious reactions from vaccines are rare.

Vaccines are well tested for safety.

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.

Vaccines help strengthen an infant's immune system.

Getting my baby vaccinated also protects other children who are too young or too sick to be vaccinated themselves.

Some vaccine-preventable diseases remain common in the United States.

Vaccines give infants and young children the best protection from 14 serious diseases.

Scientific studies and reviews show no relationship between vaccines and autism.

A baby's immune system can handle several vaccines at one doctor's visit.

Awareness and Assessment
Top Five – Frequently Provided Vaccine Messages

	Have you heard or read this statement before taking this survey?			Do you think the statement is true or false?		
	Have seen or heard %	Have not seen or heard %	Not Answered %	True %	False %	Not Answered %
Vaccines prevent potentially deadly diseases.	75.5	11.0	13.5	87.5	6.5	6.0
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
The benefits from vaccines outweigh the risks.	74.5	12.5	13.0	85.0	7	8.0
Serious reactions from vaccines are rare.	69.5	22.5	8.0	78.5	10.5	11.0
Vaccines are well tested for safety.	65.5	24.5	10.0	79.5	10.5	10.0

Influence
Top Five – Frequently Provided Vaccine Messages

	How does each statement influence your plans for vaccinating your baby?					
	Much more likely %	Some-what more likely %	Does not influence %	Some-what less likely %	Less likely %	Not answered %
Vaccines prevent potentially deadly diseases.	65.0	22.5	9.0	2.0	0.5	1.0
Vaccines help strengthen an infant's immune system.	58.5	26.5	12.0	2.0	0.5	0.5
Vaccines give infants and young children the best protection from 14 serious diseases.	57.5	28.5	13.0	0.5	0	0.5
Vaccines are well tested for safety.	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.	53.0	29.0	15.5	1.5	0	1.0

CDC's Childhood Immunization Campaign Messages

INFORMATION FOR PARENTS

| DISEASES and the VACCINES THAT PREVENT THEM |

Measles and the Vaccine (Shot) to Prevent It

Last updated: July 2014

The best way to protect against measles is to get the measles-mumps-rubella shot (called the MMR shot). Doctors recommend that all children get the MMR shot.

Why should my child get the MMR shot?

The MMR shot:

- Protects your child from measles, a potentially serious disease (and also protects against mumps and rubella)
- Prevents your child from getting an uncomfortable rash and high fever from measles
- Keeps your child from missing school or child care (and keeps you from missing work to care for your sick child)

Is the MMR shot safe?

Yes. The MMR shot is very safe, and it is effective at preventing measles (as well as mumps and rubella). Vaccines, like any medicine, can have side effects. But most children who get the MMR shot have no side effects.

What are the side effects?

Most children do not have any side effects from the shot. The side effects that do occur are usually very mild, such as a fever or rash. More serious side effects are rare. These may include high fever that could cause a seizure (in about 1 person out of every 3,000 who get the shot) and temporary pain and stiffness in joints (mostly in teens and adults).

Is there a link between the MMR shot and autism?

No. Scientists in the United States and other countries have carefully studied the MMR shot. None has found a link between autism and the MMR shot.

What is measles?

Measles is a serious respiratory disease (in the lungs and breathing tubes) that causes a rash and fever. It is very contagious. In rare cases, it can be deadly.

What are the symptoms of measles?

Measles starts with a fever that can get very high. Some of the other symptoms that may occur are:

- Cough, runny nose, and red eyes
- Rash of tiny, red spots that start at the head and spread to the rest of the body
- Diarrhea
- Ear infection

Doctors recommend that your child get 2 doses of the MMR shot for best protection. Your child will need one dose at each of the following ages:

- 12 through 15 months
- 4 through 6 years

Infants 6 months to 11 months old should have 1 dose of MMR shot before traveling abroad.

AMERICAN ACADEMY OF FAMILY PHYSICIANS
STRONG MEDICINE FOR AMERICA

American Academy of Pediatrics

PDF: Measles and the Vaccine (Shot) to Prevent It

Is it serious?

Measles can be dangerous, especially for babies and young children. From 2001-2013, 28% of children younger than 5 years old who had measles had to be treated in the hospital.

For some children, measles can lead to:

- Pneumonia (a serious lung infection)
- Lifelong brain damage
- Deafness
- Death

How does measles spread?

Measles spreads when a person infected with the measles virus breathes, coughs, or sneezes. It is very contagious. You can catch measles just by being in a room where a person with measles has been, up to 2 hours after that person is gone. And you can catch measles from an infected person even before they have a measles rash. Almost everyone who has not had the MMR shot will get measles if they are exposed to the measles virus.

Where do measles cases in the United States come from?

Measles disease can come into this country when unvaccinated U.S. residents travel internationally or foreign visitors to the United States are exposed to measles in another country and travel into the United States. The risk of getting measles may be very high for unvaccinated U.S. residents who travel abroad. The reason for this high risk is because measles is common in other parts of the world, including countries in Europe, Asia, the Pacific, and Africa. Worldwide, about 20 million people get measles each year. When people with measles travel into the United States, they can spread the disease to unvaccinated people including children too young to be vaccinated.

How many measles cases are there in the United States each year?

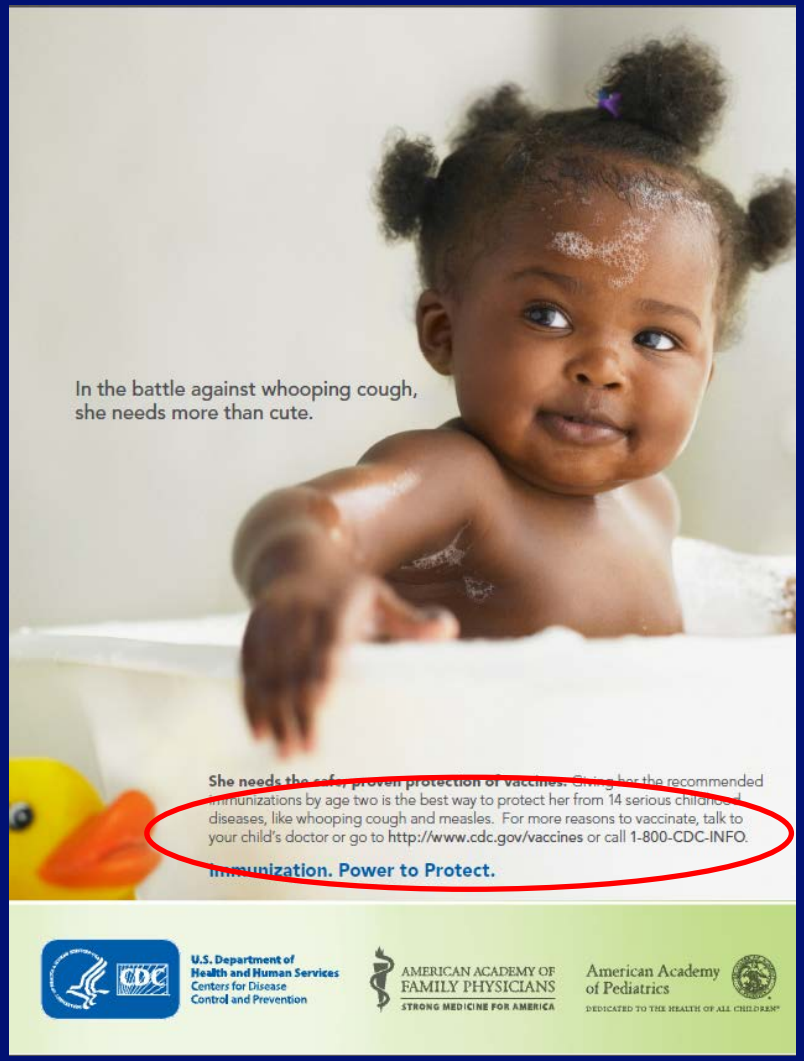
From 2001 to 2013, the number of measles cases reported in the United States ranged from 37 to 220. However, in some years like 2014, there were more measles cases than usual. In 2014, 644 people from 27 states were reported as having measles. Most of these people got measles in the United States after being exposed to someone who got measles while in another country. So far in 2015, more than 100 people in the U.S. have been reported to have measles. Most of these cases are part of a large, ongoing outbreak linked to an amusement park in California. For more information, see http://www.cdc.gov/measles/cases-outbreaks.html.

Where can I learn more about the MMR shot and my child?

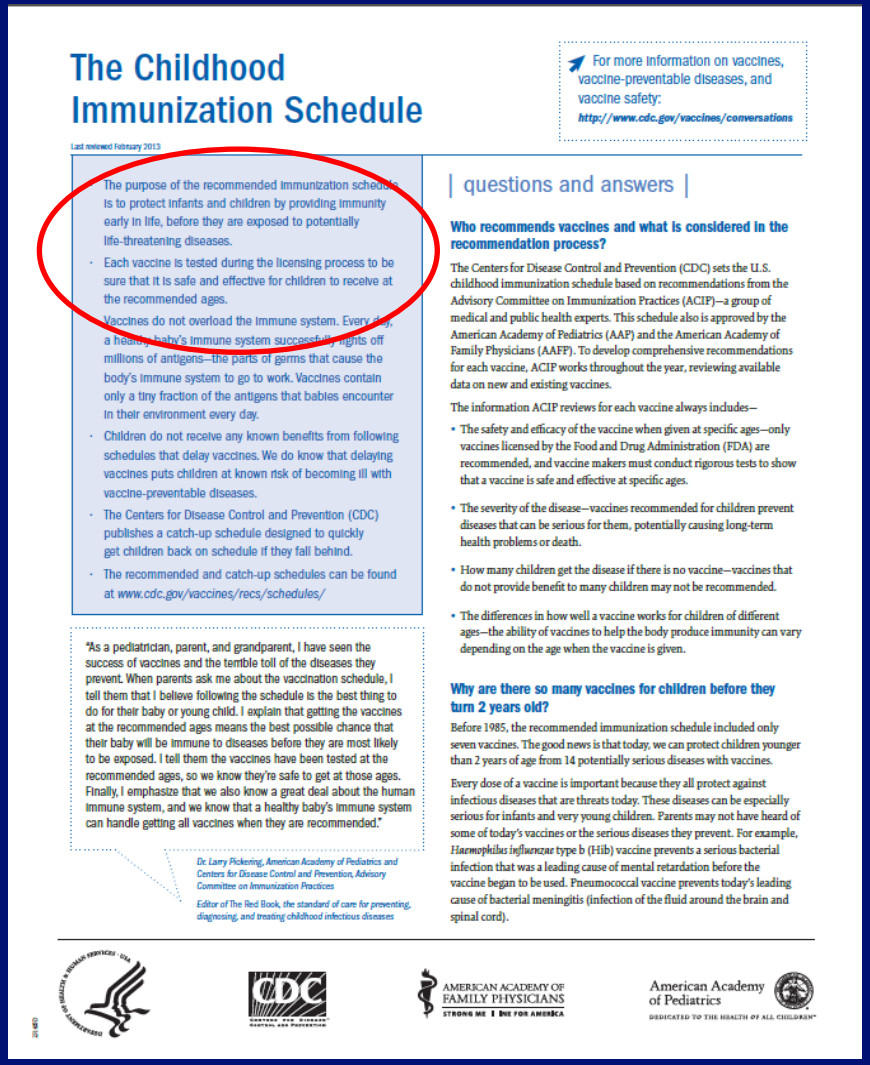
To learn more about the MMR shot, talk to your child's doctor, call 1-800-CDC-INFO, or visit www.cdc.gov/vaccines/parents.

The Centers for Disease Control and Prevention, American Academy of Family Physicians, and American Academy of Pediatrics strongly recommend children receive all vaccines according to the recommended schedule.

CDC's Childhood Immunization Campaign Messages



PDF: In the battle against whooping cough



The Childhood Immunization Schedule

For more information on vaccines, vaccine-preventable diseases, and vaccine safety: *http://www.cdc.gov/vaccines/conversations*

Last reviewed February 2013

The purpose of the recommended immunization schedule is to protect infants and children by providing immunity early in life, before they are exposed to potentially life-threatening diseases.

- Each vaccine is tested during the licensing process to be sure that it is safe and effective for children to receive at the recommended ages.
- Vaccines do not overload the immune system. Every day, a healthy baby's immune system successfully fights off millions of antigens—the parts of germs that cause the body's immune system to go to work. Vaccines contain only a tiny fraction of the antigens that babies encounter in their environment every day.
- Children do not receive any known benefits from following schedules that delay vaccines. We do know that delaying vaccines puts children at known risk of becoming ill with vaccine-preventable diseases.
- The Centers for Disease Control and Prevention (CDC) publishes a catch-up schedule designed to quickly get children back on schedule if they fall behind.
- The recommended and catch-up schedules can be found at *www.cdc.gov/vaccines/recs/schedules/*

"As a pediatrician, parent, and grandparent, I have seen the success of vaccines and the terrible toll of the diseases they prevent. When parents ask me about the vaccination schedule, I tell them that I believe following the schedule is the best thing to do for their baby or young child. I explain that getting the vaccines at the recommended ages means the best possible chance that their baby will be immune to diseases before they are most likely to be exposed. I tell them the vaccines have been tested at the recommended ages, so we know they're safe to get at those ages. Finally, I emphasize that we also know a great deal about the human immune system, and we know that a healthy baby's immune system can handle getting all vaccines when they are recommended."

Dr. Larry Pickering, American Academy of Pediatrics and Centers for Disease Control and Prevention, Advisory Committee on Immunization Practices

Editor of The Red Book, *the standard of care for preventing, diagnosing, and treating childhood infectious diseases*

| questions and answers |

Who recommends vaccines and what is considered in the recommendation process?

The Centers for Disease Control and Prevention (CDC) sets the U.S. childhood immunization schedule based on recommendations from the Advisory Committee on Immunization Practices (ACIP)—a group of medical and public health experts. This schedule also is approved by the American Academy of Pediatrics (AAP) and the American Academy of Family Physicians (AAFP). To develop comprehensive recommendations for each vaccine, ACIP works throughout the year, reviewing available data on new and existing vaccines.

The information ACIP reviews for each vaccine always includes—

- The safety and efficacy of the vaccine when given at specific ages—only vaccines licensed by the Food and Drug Administration (FDA) are recommended, and vaccine makers must conduct rigorous tests to show that a vaccine is safe and effective at specific ages.
- The severity of the disease—vaccines recommended for children prevent diseases that can be serious for them, potentially causing long-term health problems or death.
- How many children get the disease if there is no vaccine—vaccines that do not provide benefit to many children may not be recommended.
- The differences in how well a vaccine works for children of different ages—the ability of vaccines to help the body produce immunity can vary depending on the age when the vaccine is given.

Why are there so many vaccines for children before they turn 2 years old?

Before 1985, the recommended immunization schedule included only seven vaccines. The good news is that today, we can protect children younger than 2 years of age from 14 potentially serious diseases with vaccines.

Every dose of a vaccine is important because they all protect against infectious diseases that are threats today. These diseases can be especially serious for infants and very young children. Parents may not have heard of some of today's vaccines or the serious diseases they prevent. For example, *Haemophilus influenzae* type b (Hib) vaccine prevents a serious bacterial infection that was a leading cause of mental retardation before the vaccine began to be used. Pneumococcal vaccine prevents today's leading cause of bacterial meningitis (infection of the fluid around the brain and spinal cord).

PDF: The Childhood Immunization Schedule

Limitations

- Database – not nationally representative
- Sample size
- Participants were allowed to skip questions
- Excluded expectant mothers who said they did not plan to vaccinate their child
- Self-report

Conclusions

- **Overall, first-time expectant mothers had positive beliefs and perceptions regarding childhood vaccines**
- **Information sources for first-time mothers**
  - Differences in information sources for first-time expectant mothers compared to the sources we hear from parents
- **Satisfaction with vaccine information could be improved**
  - Expand efforts to provide vaccine-related information to expectant mothers
- **Continue to learn more as we follow these mothers and babies through the process of infant immunizations**

Acknowledgments

Coauthors

Judith Weiner (lead author)

Michelle Basket

Glen Nowak

Bruce Gellin

CDC

Katherine LaVail

Jennifer Mullen

Leslie Rodriquez

Kristine Sheedy

NVPO

Sharon Bergquist

Michelle Blakely

Ilka Chavez

Neka Knapp

ORAU

Sheri Hester

Allison Fisher
ark2@cdc.gov

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
Visit: www.cdc.gov | Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info