



Child Deaths From Influenza

An Expert Interview With CDC's Georgina Peacock, MD

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Posted: 08/29/2012

Editor's Note:

The 2009 influenza A (H1N1) pandemic disproportionately affected children, resulting in a 5-fold increase in deaths compared with more typical flu seasons. A study just published in the journal Pediatrics provides the first detailed description of the children most affected.^[1] The study focused on children with neurologic and neurodevelopmental disorders and found that this population has a disproportionately higher risk of dying from flu-related causes than other children. The Centers for Disease Control and Prevention (CDC) is partnering with the American Academy of Pediatrics (AAP), [Families Fighting Flu](#), and [Family Voices](#) to reach out to caregivers -- both clinicians and parents -- of children with neurologic and neurodevelopmental disorders to protect them against flu. Medscape spoke with Georgina Peacock, MD, MPH, one of the authors of this study, about the study findings, the implications for clinicians, and CDC's efforts to increase vaccination rates and the use of antiviral medications in children with neurologic and neurodevelopmental disorders.

Medscape: Dr. Peacock, could you briefly describe the methodology for your recent study?

Dr. Peacock: The CDC has been collecting information on influenza-associated pediatric deaths since 2004. This study gathered information from state and local health departments that submitted data about 2009 H1N1 influenza-related pediatric deaths to CDC. The CDC analyzed patient demographics, date and location of death, and length of hospital stay, as well as laboratory tests, including bacterial culture, and other information from these pediatric death reporting forms.

Medscape: What were the key findings regarding pediatric deaths in children with neurologic disorders? Why are these children more likely to have complications from influenza than other children?

Dr. Peacock: Children with neurologic disorders are at higher risk of dying from flu-related causes than other children. More specifically, we looked at 343 pediatric deaths that were associated with 2009 H1N1 influenza for which we had medical information. Of these, 336 children had an underlying medical condition. And when we looked in more detail, in about two thirds of those children, that underlying medical condition was a neurologic disorder. The most common of the underlying conditions were neurodevelopmental disorders like cerebral palsy, moderate to severe developmental delay (intellectual disability), and hydrocephalus. The second most common underlying condition was epilepsy.

There are different theories about why these children have more complications from influenza. Many of these children have associated medical conditions. When we looked at the children with underlying conditions, about 70% of them had more than 1 high-risk condition. That is telling us that these are children who have complicated medical histories.

There are some studies that speculate that the children with neurologic conditions may have impaired lung function, or they may have more difficulty coughing, and coughing is one way we prevent pneumonia. Some of the children have

scoliosis, which again may make it harder to cough and clear your airway. Some of those children also had a reported pulmonary condition on their death reporting form, but not all of them. It leads us to speculate that maybe there is an impairment in their ability to cough or clear their airway. But is that also impairing their ability to fight off the influenza infection?

Less frequently, we saw children with secondary risk factors that included congenital heart disease, chromosomal abnormalities, and metabolic disorders, like mitochondrial disorders.

Medscape: Although the vaccine used prior to the 2009 flu season did not cover H1N1, there were immediate efforts to both develop and distribute an appropriate vaccine. Can you describe the impact of vaccination on morbidity and mortality in your study?

Dr. Peacock: This group of children had a fairly low influenza vaccination rate. When we looked at the death reporting forms, we noted that about 23% of the children had received the seasonal flu vaccine and about 3% had received the H1N1 vaccine. Part of the issue was that a number of these deaths occurred before there was even an H1N1 vaccine available. A limitation in our ability to draw conclusions from the data is that we are reviewing a pediatric death report form, not going back and looking at medical records. It is possible that there was a higher rate of influenza vaccination, but these are the rates we were able to calculate.

Although this study looked at pediatric deaths during the H1N1 pandemic, we know that children with neurologic conditions are also at greater risk for complications and deaths from flu during regular influenza seasons. Influenza vaccination is important and we need to increase this vaccination rate, particularly among children who are at high risk for influenza. I think we have a lot of work to do. Part of what we are doing this fall at the CDC is partnering with the AAP, Families Fighting Flu, and Family Voices to really push and encourage vaccination among this group of children, both by talking with healthcare providers about the importance of vaccination of this high-risk group, as well as talking to parents about the importance of making sure they are protecting their children from influenza, because their children are at high risk.

Medscape: CDC and AAP both recommend that children over the age of 6 months receive an annual influenza vaccine. As you have noted, vaccine uptake is suboptimal. That is also the case for antiviral use. How will CDC's partnership with AAP and flu advocacy groups help address these issues?

Dr. Peacock: With the AAP, our plans are to do some communications with members -- particularly with subspecialists who care for children with neurologic conditions -- through letters that are signed both by the AAP and the CDC to encourage them to talk to the parents of their patients about vaccinations. The issue is that most of these subspecialists are not going to give vaccinations. However, they are important health messengers for this information. If the neurologist or developmentalist is talking to the family about vaccinations, we think that will encourage parents to talk with their pediatric primary care provider about getting vaccinated and put that higher on the list.

We also are doing some continuing education webinars for healthcare providers.

On the parent's side, we've been working with [Family Voices](#) to conduct focus groups looking at what parents already know about flu and vaccinations. What we have found is that we have a lot of work to do to educate parents about what influenza is and to emphasize that influenza is different from having a cold. It is really important for parents to understand when we are in flu season that, if their child is exhibiting signs of an influenza-like illness, they need to seek care from their pediatric provider and begin antiviral drug treatment if indicated. We also must continually reinforce the importance of a prevention strategy that includes their child getting vaccinated.

Medscape: Could you speak a bit more about the antiviral component of this campaign? Although you have noted the importance of reaching neurologists and developmentalists to enlist them to encourage families to be vaccinated, will they be part of the campaign's effort to optimize antiviral use? Or is that effort focused on primary care providers?

Dr. Peacock: I think it's important that we are including those medical home providers, those primary care providers, in the discussion about encouraging antiviral use. The subspecialists can back that up and, when they are talking to parents, encourage them to talk to their child's primary care provider if the child is having flu-like symptoms. It is important to get antiviral treatment early. But clearly the pediatricians, the family practitioners, those people on the frontline in the medical home are the ones who are going to be pushing that early antiviral treatment, which is really important in these kids. I think that we have a long way to go in regard to antiviral treatment.

The other important message that came out during the pandemic is that rapid influenza testing does not always identify everybody that has influenza. A negative rapid flu test does not mean the child should not start antiviral treatment if the clinician thinks that they have influenza. That is another message that the CDC has been trying hard to get out to the practitioners.

Medscape: What are the most important take-home messages for clinicians as well as the parents of these high-risk children?

Dr. Peacock: First, children need to be vaccinated every year against influenza. Then, if the child is having flu-like symptoms, they should talk to their primary care clinician and get on antiviral treatment as soon as possible if it is recommended.

Medscape: Can you speak briefly about the current swine flu increase?

Dr. Peacock: We are currently monitoring this new strain of influenza called H3N2v, and the prevention messages around this outbreak are really important. Children with high-risk conditions, like neurologic disorders, need to wash their hands, not eat food in areas where animals are kept, and should avoid exposure to pigs and swine barns. Many of the children who have been infected with H3N2v have spent time in these settings.

It is important to get vaccinated against the seasonal flu. However, the current flu vaccine won't protect against the H3N2v strain, so that's why those preventive methods are really important, and obviously any child who has a neurologic disorder who has been around pigs and is exhibiting signs of flu needs to talk to their pediatric provider as soon as possible. The recommendation right now is that if you have a high-risk condition and are having flu-like symptoms and have had contact with a pig, to be evaluated by your provider and begin antiviral treatment if indicated.

References

1. Blanton L, Peacock G, Cox C, Jhung M, Finelli L, Moore C. Neurologic disorders among pediatric deaths associated with the 2009 pandemic influenza. *Pediatrics*. 2012;130:390-396.

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