Science AMA Series: I'm Catherine Spong—OB/GYN, acting director of an NIH institute, researcher, and mom of 4. Let's talk about Zika virus and why we need to study its long-term effects on pregnancy & children infected in the womb. AMA!

NICHD$_N IH$[1]$andr/ScienceAMAs$[1]

[1]Affiliation not available

April 17, 2023

Abstract

Hello reddit! I'm Cathy Spong, and I oversee NIH's Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), which supports research on fetal, infant and child development; maternal, child and family health; reproductive biology and population issues; and medical rehabilitation. We know that Zika virus causes microcephaly and other serious birth defects, and is linked to pregnancy problems, including miscarriage and stillbirth. While our attention is rightly focused on vaccine development, mosquito control, and other measures to prevent the spread of Zika, it is also important to acknowledge that people affected by Zika today—parents, families, caregivers, and health care professionals—may be contending with unknown health outcomes for many years to come. We in the public health community need to identify optimal approaches to treat and care for children who have been exposed to Zika virus in the womb. We also need to be able to tell a woman and tell a family, the risks Zika virus poses throughout pregnancy, and research will help us understand these risks. Earlier this summer, NIH launched the multi-country Zika in Infants and Pregnancy (ZIP) study to evaluate the health risks that Zika virus infection poses to pregnant women and their developing fetuses and infants. Researchers aim to enroll 10,000 pregnant women in their first trimester and follow them throughout their pregnancies. After birth, the infants will be followed for at least one year. We anticipate that studies like ZIP will provide important information on the link between Zika infection and pregnancy complications and inform strategies to help safeguard the health of mothers and their newborns. I emphasized the need for this type of research in a recent Huffington Post blog, and NIH is hosting an open workshop on September 22-23, 2016, to find the best approaches to treat and care for children exposed to Zika in the womb. I will be answering questions starting at 2 p.m. ET (11 a.m. PT). Ask Me Anything! Edit: Hi, everyone! That wraps our chat up for today. Thank you for your questions – this was a great opportunity to discuss Zika virus and the need to study its long-term effects on pregnancy and children. Don't forget, we're hosting our scientific workshop on Zika on September 22 & 23. You can register to attend here. We will be closing this AMA thread, but if you have follow-up questions, please send us a Facebook message or tweet at us.

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NICHD_NIH R/SCIENCE

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WRITE A REVIEW

CORRESPONDENCE:

DATE RECEIVED:
September 10, 2016

DOI:

Once a woman is infected with the virus does she have the risk of birth defects for the rest of her life or do birth defects only occur in women who get the disease while pregnant?

sccrj888

At this point, we can say that we've only seen birth defects occur in the pregnancies of women who have been infected with Zika during pregnancy. We do not have evidence that prior Zika virus infection

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poses a risk to future pregnancies. Research supported by another NIH institute, the National Institute of Allergy and Infectious Diseases (NIAID), shows that protective immunity can develop in an animal model of Zika infection: http://www.nature.com/ncomms/2016/160628/ncomms12204/full/ncomms12204.html.

Based on these findings, it seems unlikely that the risk would persist in future pregnancies. But, we're learning new things about the virus every day. Additional findings from registries and studies could help us know more definitively whether future pregnancies are affected. That is one of the things we hope to learn through our ZIP study: https://www.nichd.nih.gov/news/releases/Pages/zika_zip_06202016.aspx. The CDC has two registries for pregnant women who have laboratory evidence of Zika infection.

- http://www.cdc.gov/zika/hc-providers/registry.html
- http://www.cdc.gov/zika/public-health-partners/zapss.html (Puerto Rico Only)

The World Health organization recently revised its guidance on preventing transmission of Zika virus: http://www.who.int/csr/resources/publications/zika/sexual-transmission-prevention/en/.

- For people who are returning from Zika-endemic areas, WHO recommends that they should adopt safe sex practices or consider abstinence for at least 6 months upon return to prevent Zika virus infection through sexual transmission.
- For couples (returning from Zika-endemic areas) who are planning a pregnancy, WHO also recommends waiting at least **6 months** before trying to conceive to ensure that possible Zika virus infection has cleared.

I heard that they just found that Zika virus can affect adults infected with the disease. I am not sure how, but is this true? And what is the effect on the adult in the long run? I also heard the symptoms of Zika are similar to the flu, my question is what symptom will indicate that I might have Zika? My last question is how far up the US (I live in Maryland, close to NIH) is the Zika virus expected to survive and have effect on the population? Thanks!

cutebearbaby

Your question highlights many important unknowns. As you know, the epidemic is new. Many people infected with Zika won't have symptoms or will only have mild symptoms; it is estimated that about 80% of people in Brazil who were infected with Zika did not have symptoms. For those who have symptoms, the most common are fever, rash, joint pain, and red eyes. Other symptoms are muscle pain and headache. For mild cases, these symptoms last from several days to a week. Most people won't get sick enough to need to go a hospital. Few people die from Zika.

If you've been to a Zika-affected area, you should tell your doctor. He or she may order blood tests to check for Zika or related viruses, like dengue and chikungunya. We don't have a drug or vaccine to eliminate or prevent Zika infection. To relieve the muscle and joint pain, you can take acetaminophen (paracetamol). You shouldn't take aspirin or other non-steroidal anti-inflammatory risks until dengue can be ruled out, as this can increase the risk of bleeding. You should also get plenty of rest and drink lots of fluids to prevent dehydration. Regarding your question about whether Zika will reach Maryland, the most recent information from CDC is that Maryland has had 89 cases of Zika infection, attributed to travel to Zika-affected countries. This is about 3 percent of the Zika cases seen so far in the U.S. I don't think anyone can tell you where the virus will turn up next or how widespread it eventually will become.

Thank you for being here, Dr. Spong. With all of the media hype around Zika, it seems hard to make informed decisions. My wife is pregnant and we have a long-standing plan to go on a family vacation to Florida, Disney then St. Petersburg, at the end of October. There is already a lot of financial investment that we couldn't get back if we don't go. How serious is the danger? Do we need to cancel this trip?

ginandregret

This is a great question, and one that is frequently asked. The CDC guidance states that pregnant women should avoid areas of active Zika transmission. I don't think Orlando has experienced active transmission, but there has been at least one case in the St. Petersburg-Pinellas County area. You need to determine how much risk you are willing to take, to be safe I would follow CDC guidance to help protect your family from possible Zika exposure. The CDC updates its Zika Travel advisory page regularly, and I would advise anyone planning travel to check it before you travel. Prevention is key. If you do go to an area where Zika is present, you should follow the guidance on avoiding mosquito bites and prevention of sexual transmission.

Has microcephaly always been associated with zika infection, or is this something new since the virus has hit the Americas? Given that it's been proven present in humans since the 1950s, can we explain the lack of microcephaly in the African/SE Asian countries? (i.e., do we think that is was also associated with microcephaly there, but the afflicted infants were disposed of shortly afterbirth due to shame over their handicap?).

Barlillian

Zika itself is not a new virus; it was discovered in 1947. And microcephaly is not a new type of birth defect; we know that it can result from genetic disorders or other types of congenital infections like cytomegalovirus. However, microcephaly associated with Zika infection is "new" in the sense that it hadn't been widely reported until recently. We don't know for sure if Zika infection caused birth defects in Africa or Asia (where the virus has been circulating for decades), but researchers are now looking into this to find if there was such a link in previous outbreaks. For instance, in May, researchers analyzed data from a previous Zika outbreak in French Polynesia, which occurred in 2013-2014. The study authors estimated that the risk of microcephaly was about 1% for fetuses whose mothers were infected in their 1st trimester: Lancet - Association between Zika virus and microcephaly in French Polynesia, 2013–15: a retrospective study. There's another possibility, that in areas where Zika has been circulating for a long time (Africa and Asia), people developed protective immunity early in life. This protective immunity, which developed before people reached childbearing ages, could have limited the adverse health outcomes we are seeing now in Latin America. More research is needed to find these answers.

I've heard there are already effective vaccines in test phase.

1. Is this true?
2. If so, what's the timeline for availability to the public?

Ndebted

The development of a vaccine is a major effort and will be crucial to addressing the Zika epidemic. There are several types of Zika vaccine *candidates* in early development. The National Institute of Allergy and Infectious Diseases (NIAID), one of our sister institutes at the NIH, is working on this. You can read more about their Zika vaccine candidates here: http://www.niaid.nih.gov/topics/Zika/ResearchApproach/Pages/vaccineResearch.aspx.

At the beginning of August, NIAID began Phase I testing of a candidate DNA vaccine. This study is designed to test the safety of the vaccine and its ability to generate an immune response. You can read more about the vaccine trial here: http://www.niaid.nih.gov/news/newsreleases/2016/Pages/Zika-Investigational-Vaccine.aspx and here: http://www.niaid.nih.gov/news/QA/Pages/Zika-DNA-Vaccine-QA.aspx.

As far as timing, a safe, effective, fully licensed Zika vaccine will likely not be available for several years, according to NIAID. Vaccine development requires a number of steps. When a candidate vaccine is ready for human studies, it generally needs to pass 3 phases of clinical testing. 1) It will need to be tested in a small group for safety and to see whether it can generate a protective immune response, 2) it will need further safety testing in trials involving more people, and 3) ultimately, it will need to be tested to see whether it can *prevent* Zika virus infection.

This is a little bit more general question, but can you talk about the difficulties of doing studies in pregnant women? Is there a way to identify possible dangers to them in an ethical study without first seeing problems occur in the wild? I am partly thinking about how most pharmaceutical drugs are not able to be given to pregnant women, because there is not an ethical way to verify that the drugs are safe in pregnant women.

kerovon

Although some may say that doing studies in pregnancy is difficult, I think **not** doing studies in pregnancy is more difficult because it leaves us without evidence-based information to inform care decisions. Too often, practices are adopted with limited evidence; some are later found to be ineffective, or even harmful. Concern for harming the developing fetus is always a focus in these studies, especially if giving a medication or therapy. However, not providing an appropriate treatment may result in more harm to the mom or fetus. NICHD actively works to address this critical area, through research networks, such as the Maternal Fetal Medicine Units (MFMU) and the Obstetric-Fetal Pharmacology Research Units (OPRU). The MFMU network was created to respond to the need for well-designed clinical trials in pregnant women, and to focus on clinical questions in maternal-fetal medicine and obstetrics. The mission of the OPRU network is to improve the safety and effective use of therapeutic drugs in women during pregnancy and breastfeeding. In addition, NICHD is focusing a major effort to be able to understand the structure, development, and function of the human placenta in real time, so that we may potentially avoid or prevent placental problems that can affect both mother and fetus. So while there are reasons to be cautious in this research, there are compelling reasons to do it.

New mom here. Not related to Zika... But how did you manage to raise four children while remaining so dedicated to your career? Serious question! Thank you!

SitaBird

I strongly believe that when you are passionate about what you do, anything is possible. I am fortunate to have a wonderful family that is supportive of me and who are also excited about the impact of my work. At the NIH, we have the possibility of supporting science that has global impact and addressing critical questions that may otherwise be unanswered.

I have been fortunate to combine my love of medicine with research, teaching, and education throughout my career, although the focus has shifted over time. There was a time when my clinical work was the primary component, and now it is the research. After medical school, I became Chief Resident in Obstetrics and Gynecology at the Harbor-UCLA Medical Center, Then, I came to NIH as a Maternal-Fetal Medicine Fellow and conducted research in NICHD's intramural (on-campus) research

program. I've also worked on the extramural program side, managing funded research grants through our Pregnancy and Perinatology Branch. Later, I served as Director of the NICHD Division of Extramural Research before taking on my current role of Deputy/Acting Director for the entire institute. Throughout this time, I've maintained a clinical practice in high-risk pregnancies, seeing patients every week.

One important component of balance in this situation is to be fully aware that the most important component of life is family. But only I am the mother of my children, the wife of my husband, a child of my parents, and a younger sister to my sister.

I'm curious if we understand how Zika affects the neuronal development of the fetus. In fetuses that have not survived after infection, have people looked to see if there is direct infection of the neuronal precursor cells with the virus, or if the effect is somewhere further upstream, such as systemic infection of the fetus or even placental insufficiency? Thanks

thebuddhaguy

Just to recap, during the last nine months, we have seen reports of Zika-related birth defects. In January, researchers in Brazil began reporting on fetuses with severe brain abnormalities, as well as ocular malformations.

Scientists have shown in laboratory studies that Zika directly infects human cortical neural progenitor cells with high efficiency, affecting the growth of the cells and their death. Importantly, the implications from Zika are more than just microcephaly. Researchers are finding that Zika can affect the structure and function of a baby's brain, regardless of whether the baby has microcephaly or not. Zika has been linked to brain calcifications, enlarged brain ventricles, lissencephaly (which is a smooth brain with no/few folds), and the absence of normal brain structures.

For a child, these brain changes could cause long-term consequences: hearing and vision problems, developmental and learning delays, motor issues, low birth weight, and so forth. You can learn more about Zika's effects on the developing brain in this infographic: https://www.nichd.nih.gov/news/resources/links/infographics/Pages/zika.aspx.

If you're interested in reading research papers:

http://www.sciencedirect.com/science/article/pii/S1934590916001065

http://science.sciencemag.org/content/352/6287/816

http://www.nature.com/nature/journal/v534/n7606/full/nature18296.html

My wife is pregnant (about 13 weeks now). We live in New Orleans, Louisiana. How worried should I be about the Zika virus? My wife has literally become a shut in who refuses to go outside except for work. Is there anything I can do to alleviate her fears?

bluesbottle

I am sorry to hear that she is having such difficulty. We have yet to see active Zika transmission in the New Orleans area of Louisiana, but your wife should remain vigilant against mosquito bites. You should both follow CDC guidance on protecting yourselves from mosquitoes while outdoors. If she remains very concerned, it may be helpful for her to speak with someone, like a family doctor, about her fears. There are risks in everything we do. Exposure to Zika is yet another risk, but the key is to manage that risk, and there is much guidance out there to help do that.

Do you know of any health risks to babies and children who have been exposed to Zika?

blueskiesahead

This is a very important question and one we are currently trying to address. Even though Zika has been around since 1947, we don't have clear answers on how the virus may affect young children who are infected after birth. As you likely are aware, the brain continues to develop after birth through early adulthood. Our ZIP study will help address this question, because the infants in the study will be followed through at least 1 year of age. Some of these children will not have been exposed to Zika during pregnancy so we will be able to gather outcomes if they are infected after birth. (Learn more about ZIP here: https://www.nichd.nih.gov/news/releases/Pages/zika_zip_06202016.aspx)

Again, many people infected with Zika won't have symptoms or will only have mild symptoms; many won't even know they're infected. Zika symptoms include fever, rash, joint pain, and red eyes. Other symptoms are muscle pain and headache. For mild cases, these symptoms last from several days to a week. Again, though, there is a lot that's unknown. For adults who aren't pregnant and who will not become pregnant, infection usually isn't considered serious. Because of their immature immune systems, young children can be at risk from any aggressive virus. Precautions should be taken to prevent mosquito exposure among young children in Zika-affected areas.

I live in Florida and my daughter was born with microcephaly. She's 3 months old now. Is there a way to test if her condition was zika related?

The dr doing the consultation after our 3rd trimester ultrasound joked about zika and how we shouldn't worry. She had a small head all pregnancy but was right on the line of prognosis. Took a week for her dr to say microcephaly since she wasn't showing growth fast enough. Then a few weeks later cases of zika from mosquito transmission started coming in. We had a ton of travel related cases but nothing direct.

My husband played airsoft in wooded areas and would have been bit by mosquitos often throughout the pregnancy. He could have easily given it to me.

Can we still get tested or is it too late? She doesn't see a neurologist until November so i don't know how severe her condition is but it's not as bad as the cases I've seen conning from south America. Either way I'd like to know if zika played a role so she knows when she's older.

internetwife

Thanks for this question. Your daughter is lucky to have you as an advocate for her welfare. i certainly understand the desire to clarify what is happening and how best to care for her. But, given the diagnostic difficulties, it may not be possible to determine if Zika is the cause at this time. Although you could test blood or urine for the virus itself, it is likely that—if it was present at one time--the virus is no longer in her system. There is a lot of active work ongoing to develop better diagnostics. It's important to remember that microcephaly can result from genetic disorders and other congenital infections, like cytomegalovirus (CMV), and there are a spectrum of outcomes. For some children, a small head is just a small head, and they have normal development. For others, there may be more serious outcomes, depending on what brain structures and functions are affected. Thus, the course of care and management will differ for each child. I would suggest that you continue to work with your daughter's health care providers to figure out the best course of care.

Do you think that there is anything to be learned from the treatment of congenital rubella syndrome in

the 60's that could be used to help with Zika? The two are considerably similar

iamtehwalrus42

Great question! For those who don't know, there was an outbreak of rubella (also called German measles) in the United States during the 1960s, and the virus could be passed from a pregnant woman to her fetus. Like Zika, rubella causes a rather mild illness (fever, rash, sometimes even no symptoms) in adults. But for pregnant women, it could result in miscarriage, stillbirth, or birth defects, also called congenital rubella syndrome (CRS). We have come a long way since then, when the rubella vaccination program started in 1969.

We'll be discussing this very question at a scientific workshop where we will be taking lessons learned from other viral infections in pregnancy and apply them to what is being seen in Zika. We'll discuss what we know about microcephaly and other abnormalities from other disorders and congenital infections, and how lessons learned in other scenarios (such as rubella and cytomegalovirus) may or may not apply to Zika. On Sept 22-23, NIH is hosting this workshop to find the best approaches for treating and caring for children exposed to Zika virus in the womb. Speakers from the United States, Brazil, and Puerto Rico, who are experts in obstetrics, maternal and pediatric infectious diseases, child development, rehabilitation, and vaccine research, will deliver lectures and lead panel discussions. You can read more about the workshop here: https://palladianpartners.cvent.com/ZIKV2016.

I'm a 4th year medical student applying for OBGYN - what do you think is the best way for OB's to educate themselves about Zika, especially when our patients come to us with similar questions to those found in this thread?

Thank you very much for doing this AMA!

motor_mouth

I am glad you are asking this question because a major component of public health response is education that relies heavily on providers, such as yourself. Fortunately, there are lots of resources available that provide current information for you and your patients. The NIH offers multiple websites packed with research and resources, including NICHD and NIAID.

In addition, there are other important sites to keep you updated, such as those from theWHO and the CDC. The professional societies, such as ACOG, SMFM, and AAP all post resources on their sites for providers.

Thank you for taking time out of your day to answer questions. My wife and I plan to travel to Peru in October (Lima for the first and last day, and Cusco for the middle 6). Do you know the potential for infection in those areas? We plan on wearing long sleeves and pants and utilizing bug sprays. (We also want to start a family in the next year). Any professional opinions or insight to share?

johnjensen0904

I recommend that you check the CDC website before you travel to determine if where you are traveling has active Zika transmission (http://www.cdc.gov/zika/geo/active-countries.html). CDC is updating this information regularly. I also encourage you to review how to best protect yourselves. Earlier this week, the WHO recently revised its guidance on preventing sexual transmission of Zika virus. For example, for people who are returning from Zika-endemic areas, WHO recommends that they should adopt safer sex practices or consider abstinence for at least 6 months. Learn more: http://www.who.int/csr/resources/publications/zika/sexual-transmission-prevention/en/