

# Zika linked to abnormal pregnancies, fetal death, new research finds

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Transmission electron micrograph (TEM) of Zika virus. Credit: Cynthia Goldsmith/Centers for Disease Control and Prevention

New research presents strong evidence that the Zika virus can indeed cause a range of abnormalities in pregnant women infected with the virus—with the effects manifesting any time during pregnancy. Some of

the abnormalities noted have not been reported in connection with the virus.

In a study published online March 4 in the *New England Journal of Medicine*, researchers at UCLA and at the Fiocruz Institute in Brazil found that clinical and ultrasound data in 29 percent of women who tested positive for the Zika virus revealed associations between infection and "grave outcomes" that included fetal death, placental insufficiency with low to no amniotic fluid, [fetal growth restriction](#) and central nervous system damage in the fetus, including potential blindness.

"We have found a strong link between Zika and adverse pregnancy outcomes, which haven't been documented before," said study senior author Dr. Karin Nielsen, professor of clinical pediatrics in the division of pediatric infectious diseases at the David Geffen School of Medicine at UCLA. "We saw problems with the fetus or the pregnancy at eight weeks, 22 weeks, 25 weeks, and we saw problems at 35 weeks. Even if the fetus isn't affected the virus appears to damage the placenta, which can lead to fetal death."

Nielsen, who is part of the Mattel Children's Hospital UCLA, referred to this link as Zika virus congenital syndrome.

The researchers tested blood and urine from 88 pregnant women who went to the Acute Febrile Illness Clinic at the Oswaldo Cruz Foundation in Rio de Janeiro between September 2015 and February 2016 with a rash, which is one symptom of Zika infection. They used a polymerase chain reaction test rather than an antibody test. This is because dengue, another virus common to the area that is of a similar type to Zika, has been in the country for more than 30 years and has infected the majority of the population. As a result dengue antibodies cross-react with Zika, leading to false positive results.

Of the 88 women, 72 tested positive for Zika in the blood, urine or both. Forty-two of the women who tested positive for the virus and all 16 of the women who did not test positive then underwent fetal ultrasounds. The other women who tested positive did not want an ultrasound. The ultrasounds for 12 of those women infected with the Zika virus, or 29 percent, were abnormal; by contrast, the 16 women who were not infected had normal ultrasounds.

Adverse findings in the ultrasounds of women who were infected with Zika virus included [fetal death](#) at 36 and 38 weeks gestation, in utero growth restriction with or without microcephaly, calcifications in the brain and poor development of brain structures, abnormal amniotic fluid content or abnormal fetal cerebral, umbilical or placental arterial flow.

To date, eight women have delivered babies that confirmed the findings of their ultrasounds. Of those, two infants had died in the third trimester of pregnancy. Of the six live births, two were small for gestational age, and a third infant was born with normal weight but with severe microcephaly (an abnormally small head because of no brain development). Both this infant and one of the small babies had lesions in the eyes which could indicate blindness. A fourth infant was delivered by emergency cesarean section because of no amniotic fluid in the uterus. He had immediate problems because of this but has recovered and appears to be healthy. Two infants of mothers who had normal ultrasounds have been healthy.

None of the women had any additional risk factors for abnormal pregnancies.

In late February, officials with the Centers for Disease Control and Prevention confirmed nine cases of Zika virus among [pregnant women](#) in the United States. Two of the pregnancies ended in miscarriage, two were aborted and one baby had microcephaly. Two women gave birth to

healthy babies and two other women have not yet given birth. These cases were in women who had traveled to Central and South America where Zika is spreading.

Unlike the CDC findings which were based on case reports, however, this new research is based on a cohort study—that is, the researchers followed a group of women with common characteristics, and tested them for the infection at the time of acute illness and followed outcomes.

"This is the first prospective study of Zika virus infection in pregnancy to date," Nielsen said.

Nielsen noted that this new research is important not only in finding further evidence of a direct link between abnormal pregnancies and the mosquito-borne Zika virus, but because it could dispel the theory that the disease could be caused by pesticides that have been used in the area for mosquito control, leading to calls to stop using the pesticides.

"That is a really bad idea, because you want to enhance vector control to prevent infection and not abandon that approach during an epidemic," she said.

This is a preliminary study and Nielsen noted some weaknesses. The sample size was small, so the researchers are continuing to enroll women for additional research. Also, [polymerase chain reaction](#) tests will display positive results only for the first few days following infection, so the researchers cannot say for certain that the women who tested negative for the virus were not infected. It's possible that the virus was no longer detectable, indicating a need for a reliable antibody test in patients previously exposed to dengue. However, since [women](#) all were tested for the virus early in the course of infection, it is likely Zika [virus](#) would be detectable in those who are infected, Nielsen said.

The researchers conclude, however, that the findings "provide further support to the link between maternal ZIKV-infection and fetal and placental abnormalities, not unlike other viruses known to cause congenital infections characterized by (intrauterine growth restriction) and placental insufficiency. The establishment of a scientifically credible link between ZIKV and abnormal congenital findings is of utmost importance for the effective and successful management of this epidemic in Brazil and worldwide."

Provided by University of California, Los Angeles

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