

PLOS Science Wednesday: Hi Reddit, we're Albert Ko, Manoel Sarno and Hugo Ribeiro, we published a study in PLOS NTDS showing the Zika virus may be linked to stillbirth and other adverse outcomes in addition to microcephaly – Ask Us Anything!

PLOSScienceWednesday ¹ and r/Science AMAs¹

¹Affiliation not available

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[REDDIT](#)

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My wife and I are leaving for a cruise on Sunday to Mexico, Honduras, and Belize. My stepdad is a cardiologist and said that if she gets Zika, that we shouldn't even try for a baby for two years. Is that true?

[mrwalkway32](#)

(Albert): We dont have all of the evidence needed to provide absolutely firm decisions and recommendations, but based on what we do know Zika does not cause a chronic infection and likely the period that the virus persists is short. Infection with Zika causes a viremia that last for few probably <5 days. It seems like it may persist for weeks in certain secretions like urine and semen, but not for periods over many months or years. We also havent seen cases of women exposed prior to pregnancy who have transmitted zika virus to fetus after conception

Does the Zika virus pose long term health risks to women and men?

I understand that it poses risk pregnant women for their unborn, but does it have any long term health associated risks?

[daveed2001](#)

(Hugo): There is no currennt evidence supporting any long term associated risk. However Cohorts studies certainly will answer this question.

Is there any evidence that Zika is an indefinite infection in semen? I've read that we don't know how long it lasts but do we know if anyone has ever fully cleared it from the body?

[anonano123](#)

(Albert): At this point we know that intact virus are excreted in semen and that such virus are infectious and can cause sexual transmission. However it seems unlikely that there is chronic or indefinite

excretion of the virus in semen but we need to gather more evidence since much of the data is from a few cases.

What do you think about the possible link between the antilarval used in Brazil and the rise in microcephaly? Bullshit or no?

[greatdaneshane](#)

Manoel: We didn't see any relation between agrototoxic exposure and fetal microcephaly in our cases. Our group is studying since July of 2015 and the link with Zika virus infection is very strong.

Presumably the Zika virus has been around for sometime. What would explain the recent association with birth defects and Zika virus exposure? Is the Zika virus a confounding variable and what are the possible alternative causative agents being considered (e.g. pesticides). Thanks!

[in4real](#)

Hugo: there are several explanations. Probably, the low natality rates in countries affected in French Polynesia was not able to detect the association between Microcephaly and Zika and second, the virus strain circulating in Brazil is not the same of the African one.

Would Zika follow the same outbreak patterns as Dengue in the Continental US? I keep hearing that the Southeast is at risk but there have been very few local Dengue transmissions in recent years. Why would Zika be worse and should the Southeast delay pregnancies?

[jwbaynham](#)

(Albert): We can not predict with confidence how autochthonous (rather imported) transmission of Zika will evolve but it seems likely that as you mentioned it will parallel that of dengue where there may be a few clusters of transmission in south Texas and southern Florida. We need to understand in more detail the transmission determinants of Zika in the mosquito host to be able to project the future risk and at this point we do not know if Zika will be "worse" or "better" than dengue

Is true that approximately 80% of infected people show no symptoms? If so does that mean that 80% of people are immune to the virus?

[bduino](#)

Manoel: In fact mostly of cases are asymptomatic but we still not knowing how many people were exposed to the virus. This question will be answered when a serological test become readily available

I heard that Zika is overrepresented in Brazil, compared with the neighbouring countries, and that it was caused by a water treatment chemical used to kill mosquitos. Was this bullcrap?

[nigerianfacts](#)

(Albert): At present there is no evidence to implicate an association between water supply or chemicals (in this case pyriproxyfen) and microcephaly cases

I heard that Zika is overrepresented in Brazil, compared with the neighbouring countries, and that it was caused by a water treatment chemical used to kill mosquitos. Was this bullcrap?

[nigerianfacts](#)

Manoel: there is no evidence of these informations. There are a lot of recent scientific publications linking Zika vitus with fetal malformations.

Are there possible animal models for zika infection? If you could infect mice with zika and produce birth defects, that would be an extremely definitive answer. Of course mice might be immune, using a primate model would be more complicated.

[borrax](#)

Manoel: there is a research at Federal University of Rio de Janeiro that shows the effect of the virus in contact with experimental brain.

Do we know how zika crosses the placental/umbilical boundary?

Thank you for the AMA.

[molo1134](#)

Manoel: No, we still having no answer for this question

Thanks very much for doing this Q&A. I have two questions for you;

How common is it for a virus to cause neurodevelopmental defects?

Do your observations look similar to other viral infections of fetuses? (And how do they appear different?)

[uacuaac](#)

Manoel: we have to answer this question with longitudinal studies but the fetal infection is similar with citomegalovirus. The most important difference, is that in the Zika virus infection, the fetus should be completely normal until 20-26 weeks.

Thanks very much for doing this Q&A. I have two questions for you;

How common is it for a virus to cause neurodevelopmental defects?

Do your observations look similar to other viral infections of fetuses? (And how do they appear different?)

[uacuaac](#)

(Albert): First question: A recent study found that among women who developed symptomatic Zika infection during pregnancy, 29% had fetuses that had an adverse outcome during a subsequent ultrasound examination. This is a significant and worrisome proportion.

Second question: The presentation of the Zika virus in fetuses does parallel those seen for other congenital infections such as cytomegalovirus, toxoplasmosis, etc with respect to microcephaly, cerebral calcifications, cerebral atrophy and ventriculomegaly. However there does seem to be important differences in that: 1) the unusually severe presentations of the cases we are seeing in Brazil, 2) although you can see such severe central nervous system manifestations with other infections such as CMV they usually are accompanied by manifestations that affect other parts of the fetus, and 3) there are specific lesions such as loss of the size of cerebella which seem somewhat unique in cases which we believe are due to Zika infection

How do you react to conspiracy theorists who claim Zika is not related to microcephaly? What's the best way to answer the "Zika has been around forever and has never been linked to microcephaly until now" crowd?

(US redditors might not be aware of this, but Brazilian facebook is full of whackos claiming it's somehow Monsanto's fault)

[chiphead2332](#)

Manoel: there many evidences linking Zika virus with Microcephaly although is a very new issue that needs more studies.

Hi Dr. Ko and colleagues! Thank you for doing this AMA!

I've heard that effects of the Zika virus have been witnessed in not only fetal development but also in infected individuals with still-developing brains. What does the data say about this possibility? Or how long will it take for us to get a sense?

[thisisattest](#)

(Albert): We dont have evidence at this point to indicate that Zika virus infection in infants (whose central nervous system is still developing) are associated with deleterious effects

Im traveling through Central America right now and am really concerned about this whole zika outbreak. Is there a link between Dengue, Chikungunya and Zika or is Zika a thing on its own? Thanks

[jcam07](#)

Manoel: The commom point among those diseases is the mosquito trasmission aedes aegypti besides they are exanthematic diseases with similiar clinical manifestation but they different virus related.

Thank you so much for your hard work and publishing your findings and doing this AMA! My question is how long does the Zika virus stay in your body and how long are you "infectious" after contracting the virus. Also, is there an incubation time? Thanks again!

[leergierig](#)

(Albert): thank you for your questions! Seems like this is a popular question and answers can be found in responses to other questions.

The incubation period (between initiation of infection by a mosquito bite and development of symptoms) is not well characterized but seems to be between several (three days) and one week.

Thank you very much for taking the time to do this AMA. I was wondering have you or anyone else working on Zika has been able to lock down possible epitopes or other immunodominant regions of the virus?

[spacedninja](#)

(Albert): There are several research groups throughout Brazil, NA and Europe that are embarking on this, in part for developing diagnostics and vaccines. The list is long...

How frequently has zika infection been under- or mis-diagnosed? Is it possible that other major conditions--other than microcephaly--are caused by zika infection?

[RabidMortal](#)

Hugo: It is possible, like other virus infections during pregnancy, that Zika virus causes a wider spectrum of clinical manifestations besides microcephaly. All efforts are been done to understand how Zika virus can damage the nervous system in newborns apparently normal. Research protocols are in place with this objective.

Thanks for doing the AMA! I realize they are no viable treatments just yet, but have you heard of any possible mechanistic studies that may validate a course of action to which treatment could be applied?

[octopusqueefs](#)

Hugo: We know there is a great effort in developing an effective Vaccine to protect people from Zika virus infection.

I am heading to Colombia this weekend, do I have anything to worry about (such as Guillain Barre) and what I can I do to stay safe?

[nyyanksx27](#)

Manoel: The use of icaridin based insect repellents and use of long sleeves shirts should give you good personal protection.

Has anyone performed whole genome sequencing of the Zika in Brazil vs. countries where it has been endemic without causing microencephaly? I'd be curious to see what SNPs pop up that might have made a difference in patient outcomes.

[BredPuddin](#)

Hugo: It is well known the two strains of Zika virus are circulating. The brazilian strain is the Asiatic not the African one.

Are there any reports about zika affecting the mother and child at different points along the pregnancy? I imagine that there's a big difference between the mother being infected in the first trimester compared to a few days before the delivery.

[WalkingTurtleMan](#)

Manoel: The current evidences show that in all stages of pregnancy the fetus can affected. However the worst cases are related to the first trimester. <http://www.nejm.org/doi/full/10.1056/NEJMoa1602412>

Considering that Brazil did not know much about Microcephaly and there was a large number of undiagnosed and unreported cases, how hard has it been to prove that Zika Virus have a real link with Microcephaly in a place with so few information about everything?

Best regards and congratulations,

A former student of FAMEB-UFBA

[jaderpsantos](#)

Hugo: There are several research groups in Brazil devoted to understanding the Zika infection mechanism. We are building a robust evidence that links the Zika virus to Microcephaly

Should I be worried about a "Children of Men" scenario?

Just reading the comments here it seems people are already concerned about getting pregnant. Could this become widespread enough to cause a serious decrease in birthrate from people refusing to risk pregnancy?

What diagnostic tools are there to help people know if they've been infected?

[yortuk](#)

(Albert): A significant proportion of pregnancies are unplanned and although there is fear of initiating pregnancy in regions where the virus is being transmitted, it seems likely that there will be a large decrease in fertility rates

Hello all, I know that you guys have been working at an amazingly fast rate to publish that quickly, and I sincerely appreciate it on behalf of my sister, who got the virus while she was in the Caribbean, and families everywhere.

My sister has actually enjoyed giving her blood to help researchers in Tennessee produce antibodies and work towards a vaccine, and the professionals there have been great at helping her learn more about the disease and her own immune system. I work in the biotech field myself, and I love seeing someone who is not scientific at all learning so much.

My question is, how do you think Brazil and the world should leverage the opportunity to educate our citizens on vital health issues now that fear of Zika has captured their attention? What are the best ways to help people - whether highly educated or unable to read - learn needed health practices for themselves and their families?

Also, do you folks know / work with Dr. Selma Jeronimo? She was a good friend of my aunt & uncle in Virginia, and I believe she is working on the Zika virus as well. Best of luck as you continue your work and research!

[hopeyoufindyourdaaad](#)

(Albert): Yes, know Selma very well and she is a friend and colleague. I can not speak for the Brazilian

government, but would think that this would be a key opportunity to address through education interventions that revolve around reproductive rights of women, the importance of community action in prevention, in this case vector control, and advocacy that centers on providing appropriate health care, in both public and private sectors, in addressing perinatal issues including other congenital infections (Toxoplasmosis, syphilis and cytomegalovirus remain important public health problems)

Thanks for doing the AMA!

Could you provide some insight on challenges you faced related to collaborating internationally. Were there any specific impediments you had to overcome culturally between yourselves or the researchers under you?

[Yankee Gunner](#)

(Albert): We have had success with our collaborations in Brazil since it has evolved over a 20 year process of multidisciplinary training young Brazilians, through support by the Brazilian Ministry of Health and NIH in the US, with the purpose that they build the capacity to address effectively their health challenges. This has created the foundation for longstanding collaboration and as exemplified by the article in PLoS NTD, rapid responses to public health emergencies

So zika is harmful to the baby's of mother's who get it, but is are they any effect to the mothers?

[TeaDrinker13](#)

Hugo: Besides the rare clinical complication of Guillain-Barré, the adult form of the diseases is mild and most of the time the symptoms disappears in few days.

Greetings fellows, Brazilian here. What u guys think is the most effective way to get rid of all of aedes aegypt? Is this home inspections the best method?

[damnknife](#)

(Albert): This is a key gap in our ability to address Zika but also all of the other mosquito borne viruses such as dengue and chikungunya. Unfortunately current approaches are not effective and newer approaches have not been evaluated to understand their effectiveness

What are the theories on why Zika is now affecting pregnant mothers? Have the mosquitoes mutated or do you believe there are other factors that have made people more susceptible to this virus?

[PROJECTime](#)

Probably the former affected countries with low natality rates were not possible to detect the link between the Zika infection and Microcephaly

As a person who is about to become a newly-wed and start a family over the next year or two, what are the biggest concerns about visiting countries that have a known spread of the Zika virus? There's always conflicting reports on how long you should wait to try and conceive, but it seems that there is no definitive answers as to what the long term effects could be for a woman who is eventually looking to conceive.

I suppose my main question is, should one be cautious about visiting countries until more answers are known? Or is it safe to say that if you wait X amount of time before trying to conceive, you'll be fine?

[workTheNetwork](#)

(Albert): Please check some of the responses we are providing to other questions. At this point given that Zika virus is a pathogen that we dont know much about and that we are still trying to understand the nature of the association with microcephaly and birth defects, we dont have the evidence to make clear guidelines. however the data we have to date leads us to believe that zika doesnt cause a chronic infection and that couples do not need to wait for months and years to conceive. Our current understanding given that the virus doesnt persists for extended periods (weeks to month) is that infection prior to conception does not provide a risk of adverse effects to the fetus

How do you respond to the idea that microencephaly incidents predate the Zika outbreak and are more closely linked to other factors such as poor nutrition, environmental pollutants associated with poor living conditions and other factors not related to Zika?

[Egg456](#)

(Albert): yes you are correct that there were cases of microcephaly prior to the outbreak. Microcephaly is caused by a large list of diseases including other congenital infections of the fetus as well as genetic disorders. These were likely underreported in Brazil prior to the recent Zika outbreak. However there does appear to be an increase in microcephaly cases and the severity of disease in these cases which makes us highly suspect an possible association.