

What is causing microcephaly in Brazil?

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The outbreak of the Zika virus has been widely associated with a rise in microcephaly cases in Brazil. While there is some evidence for this connection, the link has not yet been proven with scientific certainty. Alternative causes have been proposed, including immunizations, genetically modified mosquitoes, and pesticide exposure. Meanwhile, women throughout the Americas are making decisions about their pregnancies based on uncertain information. The evidence for each proposed cause must be evaluated scientifically, to make sound policies. The New England Complexity Systems Institute (NECSI) has performed such an analysis and found much information still missing.

The exact timing of Brazil's increase in microcephaly cases is uncertain due to problems with reporting, but it roughly begins nine months after the accidental importation of Zika. Evidence suggests the virus can pass from mother to child in the womb, and the virus has been found in neural tissue and [brain stem cells](#) in a few cases. Officials in Brazil have linked 41 confirmed cases of microcephaly with evidence of Zika infection in either the mother or child. Still, there is as yet no strong link between the virus and developmental disorders in other countries in the Americas.

Some of the proposed alternative causes are easier to dismiss than others. It has been suggested that DPT vaccines, a combination vaccine for diphtheria, pertussis, and tetanus, may be responsible for microcephaly. The widespread use of DPT vaccines given during pregnancy in the UK without a proportional rise in microcephaly directly refutes this claim. Another proposed cause is the release of [genetically](#)

[modified mosquitoes](#) in Brazil in 2015. It is feared that the modified genetic material may somehow make its way into humans. However, there is currently no evidence to support this scenario.

According to NECSI's analysis, the most likely alternative to the Zika virus causing microcephaly is exposure to the pesticide pyriproxyfen. This chemical is used to disrupt mosquito development and has been applied to drinking water in Brazil only since 2014, and not in other locations. While pyriproxyfen has been approved for this use, the study of its developmental neurotoxicity was performed by the company that manufactures it and this research is not widely available to the public. NECSI has received and reviewed the corporate study and found the evidence for its safety limited. It even provides some evidence for neurodevelopmental harm consistent with microcephaly. There is a need for further research and greater transparency.

The Zika virus remains the most probable explanation for the rise in microcephaly cases in Brazil, but the possible role of pyriproxyfen exposure requires further research. A large scale experiment is currently underway in the Americas, for better or worse. This is a real world experiment. The Zika [virus](#) has been present in Colombia for a number of months with only a few reported case of microcephaly, and pyriproxyfen is not widely used in that country. If microcephaly cases in Colombia do not begin to increase by June or July of this year, the case for Zika as the cause will be seriously undermined, and the need for research into alternative causes will become critical.

More information: The paper is available at [necsi.edu/research/social/pand ... mics/zikacauses.html](https://necsi.edu/research/social/pand...mics/zikacauses.html)

Provided by New England Complex Systems Institute

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