Medical Xpress

Study suggests size of Zika epidemic may be underestimated

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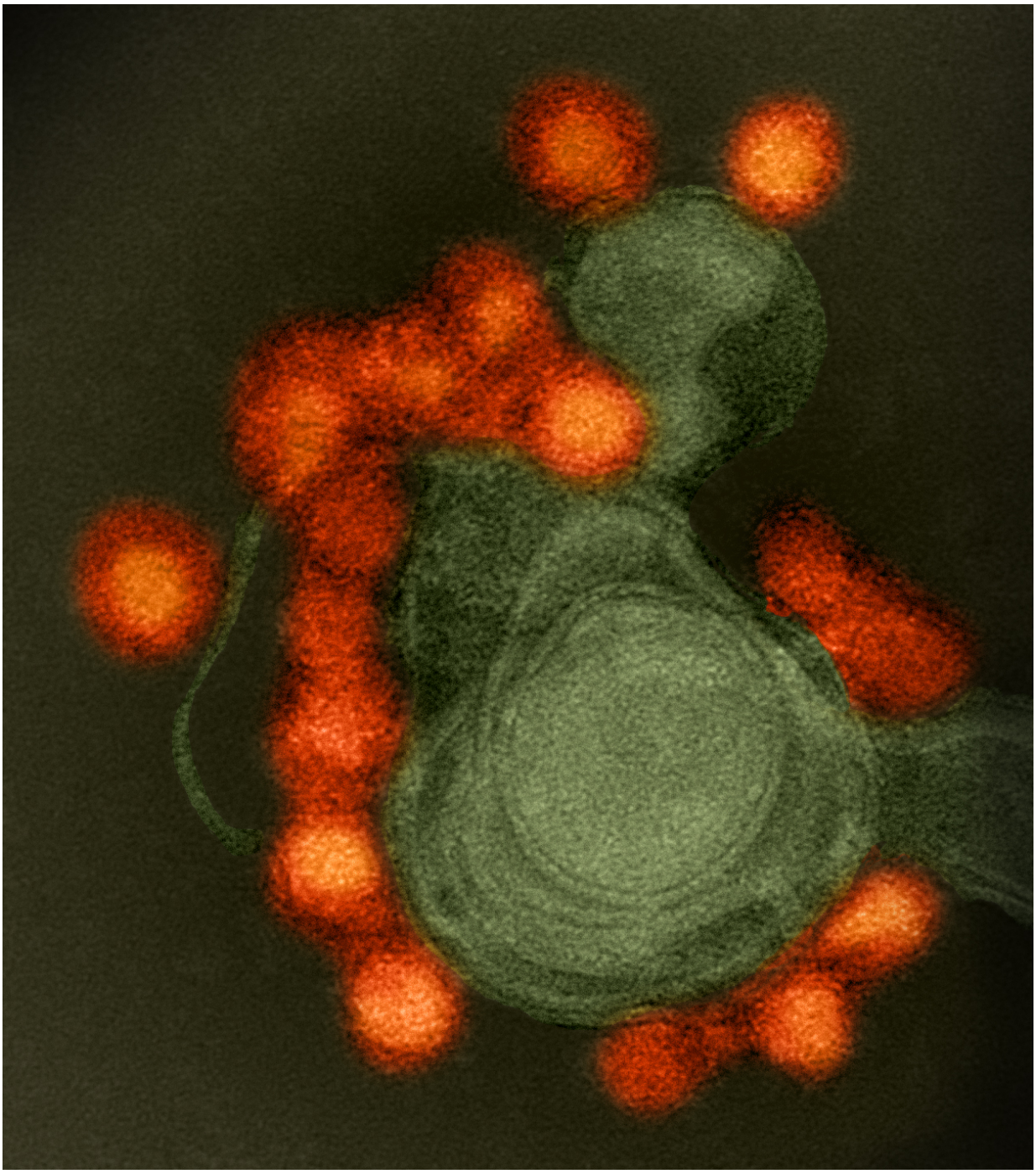

Transmission electron microscope image of negative-stained, Fortaleza-strain Zika virus (red), isolated from a microcephaly case in Brazil. The virus is associated with cellular membranes in the center. Credit: NIAID

A study supported by FAPESP and coordinated by researchers at the São José do Rio Preto Medical School (FAMERP) in São Paulo State, Brazil, suggests official statistics may underestimate the size of the epidemic caused by Zika virus. Some cases of Zika may be misreported as dengue, the authors also argue.

The team, led by Maurício Lacerda Nogueira, a member of the Zika Research Network (Rede Zika), performed molecular tests on blood samples from 800 people treated as suspected dengue patients at the emergency facility of Hospital de Base, São José do Rio Preto's reference hospital, between January and August 2016.

The material was supplied by Hospital de Base, which is also FAMERP's teaching hospital, and by the city's health department.

The initial diagnosis, based on clinical symptoms and serological tests, was confirmed in only 400 samples. More than 100 of the cases analyzed were positive for Zika virus, and the virus that causes chikungunya fever was identified in one of the samples.

None of the three arboviruses transmitted by *Aedes aegypti* was found in the remaining samples (almost 300). The researchers suspect these patients probably had flu or some other viral disease. Their findings were published this month in the *Journal of Clinical Virology*.

"These results suggest the classic division usually made between symptoms - associating conjunctivitis with Zika and joint pain with chikungunya, for example - is only for classroom use. In practice, the symptoms can't be separated like that," Nogueira said. "It's also practically impossible to distinguish between the three arboviruses with the serological tests currently used on a routine basis by laboratories and emergency services."

Although new serological methods capable of distinguishing accurately between Zika and dengue antibodies have been developed, so far they are used only in academic research, he added.

The methodologies currently available to the public health system and private labs and hospitals may also produce false positives for dengue in patients with Zika, according to Nogueira, because the two viruses are so similar.

The World Health Organization (WHO) recommends that all cases with an uncertain diagnosis should be treated as dengue because the risk of death from dengue is higher than from Zika and chikungunya.

False-positive results for dengue do not jeopardize treatment of patients but generate unnecessary costs for the health service, according to Nogueira.

"Rest and oral rehydration at home is usually sufficient for people with Zika, except pregnant women," he said. "A dengue patient, however, must return to the health service for intravenous rehydration and undergo more complex tests. In particular, platelet levels have to be monitored owing to the risk of hemorrhage."

For Nogueira, false positives are, above all, a cause for concern because they create uncertainty about official epidemiological statistics.

Uncertainty about the statistics tends to undermine the effectiveness of public policy to prevent and treat diseases, Nogueira added, in addition to hindering studies of the cost effectiveness of dengue vaccines and (in the future) Zika vaccines.

"If the estimated number of cases is wrong, vaccine cost effectiveness estimates will also be wrong," he said.

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