

## WHO reveals its shopping list for weapons against Zika

Expunging its weak performance against the recent Ebola epidemic, WHO takes swift steps to make sure that the world will have new ways to battle Zika virus. John Maurice reports.



If viruses had ears, Zika virus would be in bad shape after listening to a WHO official describing the armamentarium the world is getting ready to launch against it. “Based on our experience with research and development during the west Africa Ebola epidemic, WHO’s [R&D] response is proceeding very quickly for Zika”, Marie-Paule Kieny, WHO Assistant Director-General, Health Systems and Innovation, told a press conference on Feb 12 at the agency’s headquarters in Geneva, Switzerland. WHO, she said, has identified industry and research institutions interested in developing the tools needed to combat the Zika epidemic now taking hold in 26 countries (panel). There is an urgent need for vaccines, diagnostic tests, and prophylactic medicines against Zika as well as innovative technologies to pit against the mosquitoes that carry the virus.

In the vaccine arena, the chase is on between 15 research groups, most of which are in Europe. Nearly all are still in the early stages of vaccine development. Leading the pack by a small margin is a team at the US National Institutes of Health working on several vaccines and another team working in an Indian firm, Bharat Biotech. Candidate vaccines in the pipeline are either based on attenuated viral vectors, as is the case for the recently licensed dengue vaccine, or on inactivated products (DNA, recombinant proteins, or killed Zika virus), as is the case for some of the licensed Japanese encephalitis vaccines.

An encouraging factor in developing a vaccine against Zika virus, Kieny noted, is that “Zika is a flavivirus and vaccines have been successfully produced against other

flaviviruses, such as yellow fever, Japanese encephalitis, and dengue”. A somewhat discouraging factor she noted is that “all the Zika vaccine candidates are at a very basic level and it could be something like 18 months before large-scale trials could begin”.

The challenge to produce reliable diagnostic tests needed to facilitate research, clinical management, and surveillance activities has attracted

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ten biotech companies. Three types of tests are being developed. One is needed to detect the presence of the virus in an infected person and to determine in what body fluid it is found. Another is an antibody-based test for detecting a past infection. And a third is a rapid diagnostic test that is field-friendly and can give a result on a dipstick within minutes. “So far none of these tests have been independently validated and none have regulatory approval”, said Kieny. “We need to be sure that poor-quality or fake Zika tests will not be around, as was the case with the Ebola epidemic.”

“Studies”, Kieny pointed out, “are also underway on antiviral medications, particularly prophylactic products that could prevent infection in vulnerable people, especially pregnant women”.

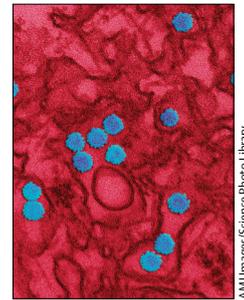
Research and development efforts are also targeting the *Aedes aegypti* mosquito vector of Zika virus. “Some innovative methods of preventing transmission of Zika to people seem promising”, Kieny said. One strategy reduces the local mosquito population by releasing into the environment

bacteria that can prevent the reproduction of the insects. Another achieves the same purpose by using male mosquitoes engineered to carry a lethal gene that alters the viability of the eggs that they have fertilised.

A lesson WHO learned from the Ebola epidemic, Kieny explained, is the need, during a life-threatening epidemic, for a fast-track system that allows the deployment of new promising tools that have not run the full gamut of safety and efficacy testing but could save lives. “WHO”, Kieny said, “has set up a WHO Emergency Assessment and Listing procedure, which guarantees a certain level of quality and performance, balancing a small risk against a high risk of mortality and morbidity from an epidemic”.

WHO is also preparing a so-called R&D Blueprint roadmap “that will facilitate a swift research and development response to an epidemic”. Last December, a group of experts met in WHO’s Geneva headquarters to draw up a list of diseases qualifying for activation of the R&D Blueprint. Zika was high on the list.

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Published Online  
February 16, 2016  
[http://dx.doi.org/10.1016/S0140-6736\(16\)00390-1](http://dx.doi.org/10.1016/S0140-6736(16)00390-1)

### Panel: Zika numbers as of Feb 12, 2016

Since 2007, 46 countries and territories have reported transmission of Zika virus. In 2015 and 2016, the virus was circulating in 26 countries. Brazil, where an estimated 1.5 million cases have occurred, heads the roster of affected countries, followed by Colombia with more than 25 000 suspected cases and 1331 confirmed cases, and by Cape Verde, with more than 7000 suspected cases.

Six countries—Brazil, French Polynesia, El Salvador, Venezuela, Colombia, and Suriname—have reported an increase in cases of microcephaly, Guillain-Barré syndrome, or both. However, WHO states that there is no scientific evidence to date that confirms a link between Zika virus and the two conditions.