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Arboviruses emerging in Peru: need for early detection of febrile syndrome during El Niño episodes

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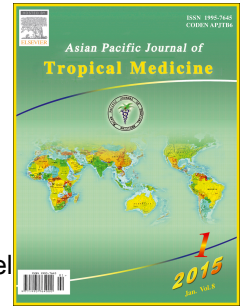
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**Title:** Arboviruses emerging in Peru: need for early detection of febrile syndrome during El Niño episodes

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## ABSTRACT

The presence of El Niño Southern Oscillation (ENSO) implies the presence of fluctuating rains in coastal areas and these changes influence the occurrence of febrile syndromes outbreaks.

In Peru, *Aedes aegypti* is the vector responsible for various viruses such as the dengue, Zika, chikungunya, which is distributed in 18 Peruvian departments. These viruses cause similar

clinical characteristics in the host and for this reason rapid, sensitive and specific diagnostic tests are needed so that the patient can receive timely treatment.

Dear editor,

Dengue virus, chikungunya virus and Zika virus share *Aedes aegypti* as vector, which is distributed in 18 Peruvian departments, making more than 15 million people at risk[1,2].

Invasive and adaptive capacity of mosquito is favored by environmental and sociocultural factors related to the formation of breeding sites, which include the use of containers to store water (in rural areas not supplied with potable water) and rainy climates[3].

The presence of El Niño Southern Oscillation (ENSO) implies the presence of fluctuating rains in coastal areas and this is sufficient data to demonstrate that the incidence of dengue and others febrile syndrome are correlated to the intensity of the events that may cause the ENSO[4].

Same argument could be applied in chikungunya and Zika, infectious diseases because they share a clinical symptomatology with dengue, mainly characterized by fever, myalgia, headache and rash.

Actually, chikungunya and Zika viruses cause an epidemic in Caribbean and regions of South America, but in nearly future they could become a serious public health problem in Peru. Last year, chikungunya fever affected more than 1 million people in Latin America[5]. Regarding to Zika, the incidence in South America has begun in Brazil, and it is strongly associated with congenital abnormalities such as microcephaly in newborns[6].

Until now, in Peru, only four cases of Zika infection have been reported[7] and, until 2014, only 11 cases of chikungunya[8]. In 2015, 39 440 cases of dengue have been reported, being the highest number of cases reported in the last 15 years. Among these, only 20 035 cases (50.8%) have been diagnosed[9], while for other 49.2%, etiologic diagnosis has been not confirmed.

On the one hand, the diagnosis and subsequent notification of dengue cases are difficult due to similar clinical symptoms with others febrile syndromes. The use of molecular techniques is limited to most severe patients, and this phenomenon generates underreporting of cases. The Polymerase Chain Reaction (real-time qPCR) and IgM ELISA allow probable and suspect cases to meet laboratory criteria and enter the category of confirmed case. These laboratory techniques are needed to realize an adequate diagnosis and a correct surveillance.

Unfortunately, lack of resources for the purchase of instruments to process samples makes it difficult to diagnose cases of dengue in Peru. Most probable cases are classified as 'confirmed case' by epidemiological link, but the introduction of molecular biology and serology could improve the correct diagnoses and should be applied to all patients with suspected dengue. The clinical diagnosis is highly sensitive molecular tests but molecular and serologic techniques have more specificity[10].

The main reasons for the accurate and early diagnosis of dengue are the complications involving severe dengue in secondary infections (infections by a different serotype of the first infection) [11]. Coinfection with a second serotype may result in shock, organ failure and severe bleeding, so early diagnosis may result in more effective treatment.

Finally, ruled out cases of dengue, will improve the surveillance of chikungunya and other arboviruses as Zika, which are responsible for a current epidemic in countries where the vector is endemic.

### **Conflict of interest statement**

We declare that we have no conflict of interest.

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