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**Category: 1g. Diagnostic virology (other than hepatitis & HIV)**

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## **The Asian Zika virus in Singapore does not cause false positives with the SD dengue NS1+Ab combo assay**

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**Background:** ZikaVirus spread from Africa to the Far East and Micronesia over several decades. It is generally a mild infection, with only 20-30% experiencing a febrile syndrome with headache, conjunctivitis, myalgia and rash. The outbreak in South America in 2015 highlighted the greatest concern, that infection during pregnancy has the potential to cause congenital malformations. For this reason it is desirable to distinguish ZikaV from Dengue Virus and other causes of similar syndromes. ZikaV shares the same mosquito vector as DenV, *Aedes aegypti*, and the viruses often co-circulate. Previous reports have suggested that commercial DenV NS1 antigen kits might cross react with ZikaV to give false positives for DenV and confuse the possible diagnosis of ZikaV.

Dengue is endemic in Singapore, with 200-900 cases /week. An outbreak of ZikaV in August 2016 gave us the opportunity to assess the routine DenV NS1 assay for false positives due to ZikaV infection.

**Material/methods:** An audit of routine laboratory data at Tan Tock Seng Hospital, Singapore. Records of patients with a positive 'in-house' ZikaV rt-PCR result were collated. The NS1 assay was the SD Dengue NS1+Ab Combo Assay (Alere) which reports DenV NS1 as well as anti-DenV IgM and IgG. Samples positive for both ZikaV and DenV NS1 were tested with the CDC DENV-1-4 Real-Time rt-PCR assay which detects DenV and gives the DenV serotype.

**Results:** There were 130 Zika positive patients with DenV NS1 results. The ct values from the ZikaV rt-PCR varied from 22 to 39.

127/130 ZikaV patients were negative for DenV NS1. Only 3 of the 130 were positive for DenV NS1, repeatedly. Their ZikaV rt-PCR ct values were 38, 39 and 39. Two of these three were Dengue rt-PCR positive, one serotype 1 and one serotype 3, so their NS1 results were appropriate. These could be dual infections or the ZikaV rt-PCR results could possibly be false positives.

The third patient had both negative DenV rt-PCR and IgM but the DenV IgG was positive. The patient had been ill 12-15 days earlier with fever, arthralgia and conjunctivitis. If he had had dengue, we would expect the dengue rt-PCR to be 'not detected' so late after illness, so the negative result doesn't contribute to the discussion. Repeated ZikV rt-PCR on urine with the original and an improved in-house assay were positive (ct = 38 and 33) so the ZikV diagnosis appears real. This could have been a dual infection but the positive Dengue IgG might reflect previous dengue infection, in which case this could have been a false positive Dengue NS1; we can't be certain.

**Conclusions:** Only 1/130 patients with ZikaV possibly had a false positive Dengue NS1 result. If there is any cross reaction, it is unusual.