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**PREDICT**

# EXPOSURE TO SELECT VIRUSES OF CONCERN IN TWO DISTINCT ECOLOGICAL AREAS OF NEPAL

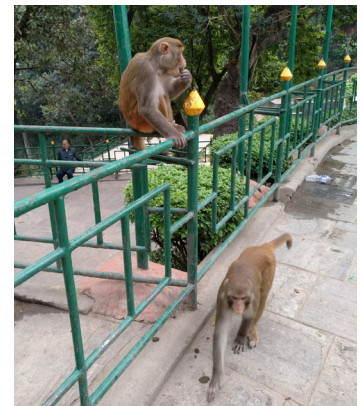
Patients at Patan Academy of Health Sciences (PAHS) hospital and Chitwan Medical College (CMC) with fever, influenza-like illness, cough, diarrhea or vomiting, headache or joint pain, and convulsions or altered consciousness were examined for infection and previous exposure to select viruses of concern. Serological diagnostics were performed in order to better understand past potential zoonotic virus exposures in the region and inform needs for further investigations and confirmatory diagnostic testing that could be needed in the future.

Specifically, blood samples from 200 patients sampled at PAHS (n=103) and CMC (n=97) were screened for antibodies to eight virus groups in collaboration with U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID). Serologic assays can also be difficult to interpret due to cross-reactivity between viruses within a given viral family or genus, including novel viruses that have not yet been discovered, that may or may not cause illness.

Preliminary results from this pilot study indicate that exposure to flaviviruses was common in patients sampled, with 30.5% of patients having IgG and 1.0% of patients having IgM pan-flavivirus antibodies. Additionally, exposure to Rift Valley Fever Virus-like viruses was detected in 6.5% (IgG: 4.5% & IgM: 2.0%) of patients, alphavirus was detected in 4.5% of patients (IgG: 1.0% & IgM: 3.5%), Crimean-Congo hemorrhagic fever-like virus was detected in 4.0% of patients (IgG: 3.5% & IgM: 0.5%), and hantaviruses was detected in 3.5% of patients (IgG: 1.0% & IgM: 2.5%).

Flavivirus exposure was significantly higher in patients at CMC (47.4%) compared to PAHS (14.6%). Higher rates of exposure in patients at CMC is likely because 91.0% patients receiving care at this clinic were from the Terai ("flat land") region of Nepal, where mosquitoes carrying flaviviruses, including Japanese encephalitis virus and dengue virus (serotype DENV-1 and DENV-2) are prevalent (1:7). Chitwan district and other areas in the Terai have had focal epidemics of dengue outbreaks (4:5). Serological evidence of Japanese encephalitis and West Nile virus has also been detected in domestic animals of Nepal (7). Previous vaccination to Japanese encephalitis virus could also explain some seropositive results on the flavivirus serologic assay (6). People who reported working in crop production or as a homemaker had significantly higher risk of previous exposure to flaviviruses. Chikungunya virus, an alphavirus, has also been reported previously in Nepal, particularly in the Terai region (8). Although cases of Crimean-Congo hemorrhagic fever, Rift Valley fever, and hantaviruses have been documented in Asia (9), there has been limited surveillance for these pathogens to-date in

Nepal. Preliminary data for viruses detected by serologic assays reported here should be further evaluated with confirmatory serologic tests and molecular detection methods to specifically identify viruses underlying acute viral infections in Nepal.



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