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Author: Mr. Samuel Malloy
The Ohio State University, United States

Dr. John M. Horack
The Ohio State University College of Engineering, United States
Dr. Elizabeth Newton
The Ohio State University, United States

TARGETS FOR SATELLITE-BASED EMERGING DISEASE SURVEILLANCE: ECOLOGICAL CHANGE AND ZOONOTIC BAT VIRUSES

Abstract

Emerging infectious disease (EID) events pose considerable risk to global health security, and occur at an increasing frequency despite advances in global medical infrastructure. We discuss the role of satellite remote sensing in EID surveillance and highlight the most applicable emerging disease targets for this approach. Specifically, we describe current capabilities to observe the ecological changes that promote zoonotic transmission of viruses from wild bat populations to humans. This includes pathogens of diverse viral groups, including SARS-like coronaviruses, hemorrhagic fever filoviruses and a range of paramyxoviruses. Given that bats are host reservoirs for the etiological agents of several key emerging diseases, including Ebola, Marburg hemorrhagic fever, Nipah virus and Hendra virus, satellite-based observations of ecological change can be a critical component of global health surveillance. We propose a monitoring system for early detection of zoonotic viruses carried by bat populations and describe relevant satellite applications in development.