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Diverse hosts contributing to the diversity of influenza A virus

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Surveillance has shown aquatic birds, particularly migrating waterfowl, to be reservoirs for nearly all of the currently recognized influenza A viruses. Recently traditional and diverse influenza A viruses have been detected in bats and other species such as seals, suggesting multiple species may play a role in transmission and emergence. A broader surveillance approach has led to an increased detection of animal-origin infections in humans following animal contact. We performed a retrospective analysis of available influenza A sequences examining high-priority animal-origin subtypes between 2000 and 2011 from 32 different countries to identify trends in evolutionary dynamics to better understand where novel strains may next emerge and to identify data gaps in knowledge due to reporting effort. As part of ongoing surveillance under the USAID funded PREDICT project, we also performed global screening of samples from diverse hosts including bats and rodents globally and through joint surveillance with NOAA and NIAID we screened for influenza A viruses in marine mammals off the Pacific coast of the United States from Alaska to California. Retrospective analyses indicated that mutation rates were higher in Asian countries, particularly in East Asia. Diverse influenzas were detected in new hosts and locations, including in bats in South America and Africa, rodents in Asia and human and avian-origin influenzas were detected in seals off California. Finally, we identified major global gaps in influenza reporting and in broad subtype testing which will continue to hinder efforts to track the evolution and diversity of influenza A viruses around the world.

Biography

Tracey Goldstein is an Associate Director and Professor at the University of California Davis, One Health Institute, where she developed and oversees the One Health Institute Laboratory and the Marine Ecosystem Health Diagnostic and Surveillance Laboratory. She is also the Co-PI and Pathogen Diagnostics Co-Lead for the viral emergence early warning project PREDICT, developed with the US Agency for International Development's Emerging Pandemic Threats (EPT) Program.

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