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NAMRU-6: Staying Ahead of Emerging Infections

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(NO COMMENTS)

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**Editor's note: This is number five in a series of six blogs from [NAMRU-6](#)*



NAMRU-6 conducting surveillance for hosts and vectors of infectious disease from areas presenting risk of human exposure. (Photo courtesy of NAMRU-6)

How do we ensure our readiness against the threats of tomorrow? Medical researchers must continuously study the emergence of new diseases to keep pace with the evolution of pathogens that threaten not only our military personnel but the global population. The ability of influenza virus to easily change its genetic composition has caused significant outbreaks, from the 1918 flu pandemic to as recently as the 2009 pH1N1 pandemic ("swine flu").

There are numerous ways that emerging infections can arise. The organisms themselves can mutate and change to become a new pathogen unrecognized by the immune system of a

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susceptible population (e.g. influenza). Environmental factors can lead to pathogen vectors and hosts (e.g. mosquitoes, rodents, etc...) moving into new regions. There are also social and economic conditions such as changes in human demographics and trade, economic development, breakdowns in public health structure, and civil conflict that can provide opportunities for pathogens to spread and introduce themselves into a new region or susceptible populations.

With so many factors that contributing to the emergence of new infections, how do we keep our capabilities in step and even move ahead of the evolution of these microorganisms? This is an important question for the [NAMRU-6 Emerging Infections Department \(EID\)](#). One way is to study the factors mentioned above that can lead to an emerging pathogen. EID currently studies influenza virus transmission in four distinct [ecological](#) regions in Peru and to have a greater understanding of how influenza viruses evolve under these diverse environmental conditions. We have studied the impact on zoonotic disease vectors and hosts in the southern Amazon region of Peru as rapid changes in human demographics and trade have been created with the introduction of the Inter-Oceanic Highway in South America, which cuts through previous remote Amazon forest to connect the Atlantic side of Brazil to the Pacific side of Peru. Our Biomedical Informatics Unit maintains an electronic syndromic surveillance network among host nation militaries in the region to rapidly identify outbreaks of infectious disease in the region.



NAMRU-6 forms partnerships with the Peruvian military through workshops that provide training rapidly recognize disease trends among military personnel so that outbreaks can be quickly detected and controlled. (Photo courtesy of NAMRU-6)

The greatest potential to stay ahead of pathogens may lie in the laboratory, where NAMRU-6 has developed and implemented state-of-the-art techniques to detect both routinely circulating and novel emerging pathogens. Our team of highly specialized scientists are necessary to ensure we advance our laboratory technologies.

Here at NAMRU-6, we are advancing our pathogen detection capabilities through a joint effort with the [Center for Infection and Immunity at Columbia University in New York](#) (a [World Health Organization Collaborating Center for Diagnostics, Surveillance and Immunotherapeutics for Emerging Infectious and Zoonotic Diseases](#)) and the [U.S Army Edgewood Chemical Biological Center Genomics group](#).

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We aim to provide rapid and accurate identification of infectious agents that may pose epidemic and pandemic threats in South America and around the world. NAMRU-6 EID is presently implementing a diagnostic assay with the ability to detect up to 20 infectious agents in a single test, as well as techniques that will allow us to better characterize known pathogens and discover novel pathogens. These capabilities can provide incredible value by decreasing the amount of time and funding needed to put information into the hands of decision makers to protect both military and civilian personnel from infectious disease threats. These efforts will also support host country colleagues in expanding the ability to diagnose infectious diseases and further strengthen regional and global biosurveillance activities.

Click on the following links to see the series of blogs from NAMRU-6: [1 \(NAMRU-6 overview\)](#), [2 \(bacteriology\)](#), [3 \(entomology\)](#), and [4 \(virology\)](#).

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