Detecting Pre-Pandemic Viral Species in Animals and Human Animal Workers in North Vietnam

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OBJECTIVES
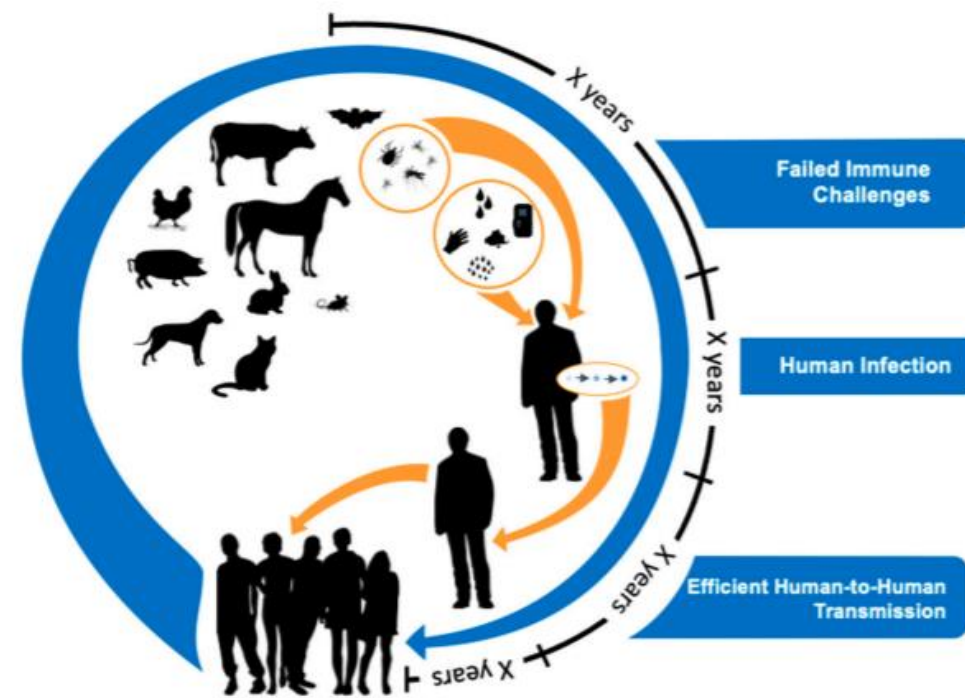
Model for zoonotic pathogenesis

This project sought to analyze bioaerosol samples collected from swine farms in North Vietnam for detection of viruses with pandemic potential. Pan-coronavirus and pan-paramyxovirus assays were utilized to screen all of the provided samples. PCR results were analyzed, quantified, and sequenced to provide numerical statistics on the screened specimens.

- Investigate effectiveness of surveillance and value of One Health based research

- Explore advantages of bioaerosol sampling

- Understand targeting of swine farms and geographic hotspots for novel virus detection

- Analyze feasibility of minimally invasive surveillance and sampling

METHODOLOGY

This project utilizes conventional PCR methods to analyze conserved regions of viral species followed by DNA sequencing to determine specific strain.
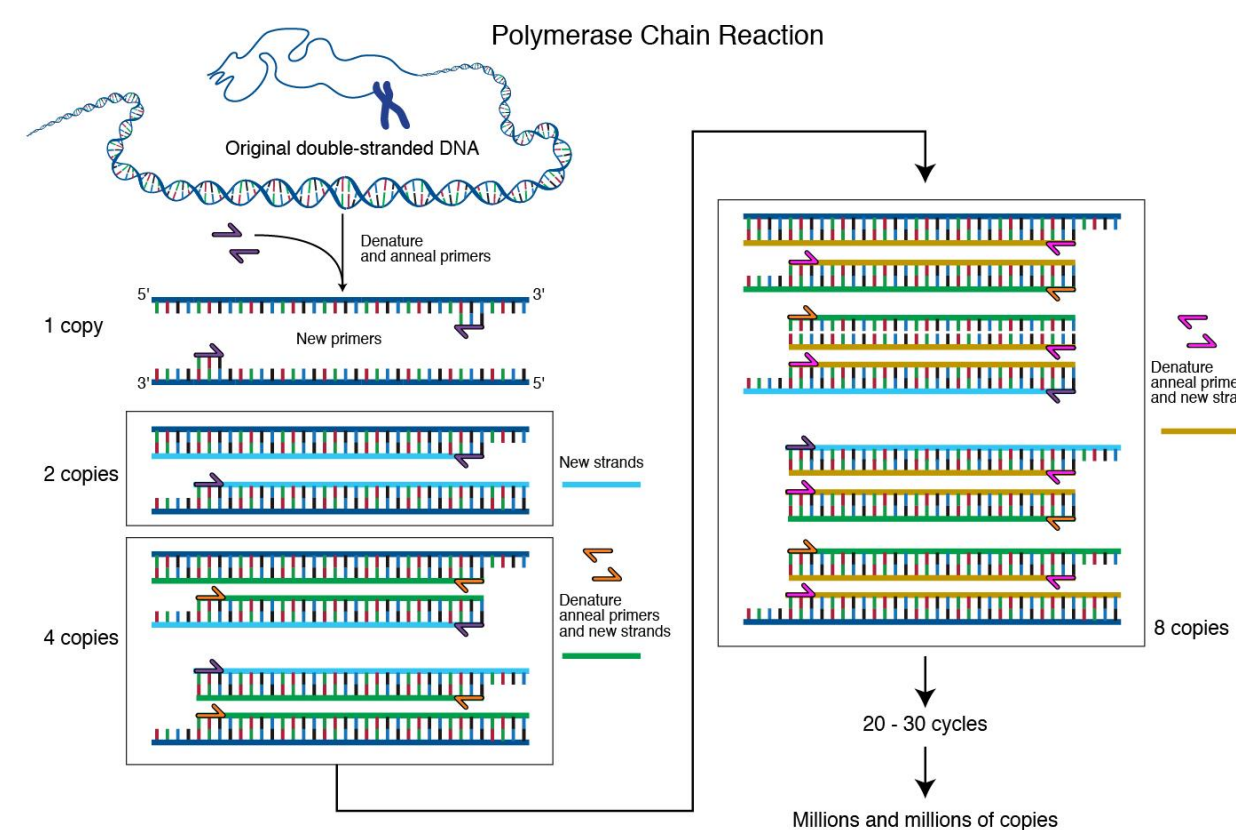
Currently, 256 samples were screened for coronavirus species with results yielding 0 positives. 172 samples were also screened for paramyxovirus and of these 2 were positive.

Pan-Assay Viral Positives

	Positives	Total Samples
Pan-Coronavirus	0	256
Pan-Paramyxovirus	2	172
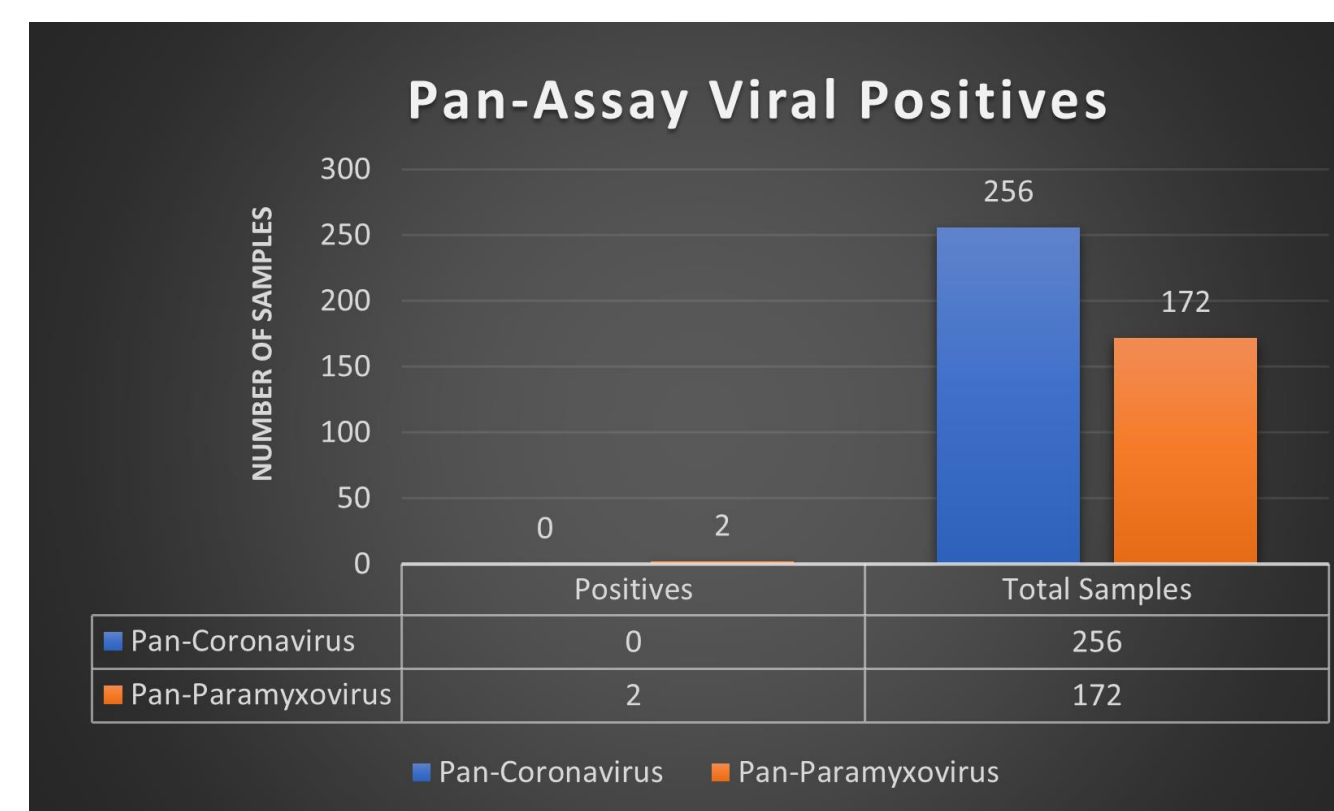
CONCLUSIONS

Worldwide pandemics are responsible for staggering costs to human morbidity, mortality, and economies. It is understood that much of the process of zoonotic respiratory virus disease requires frequent animal and human contact to amount to spillover. As a result, early surveillance at this human-animal interface in geographic hotspots for emerging infectious diseases is an effective strategy in proactive pandemic preparation.

This study showed relatively low amounts of viral positives in the samples, a good sign that at the moment, the swine farms they were taken from are not at risk for spilling over those specific viruses.

This project plays a role in the long-term One Health goal of developing a sufficient surveillance system to screen and identify novel viruses capable of causing future pandemics. Bioaerosol samples were shown to be effective methods for viral surveillance. Future work will expand on a wider selection of swine farms in North Vietnam.

Don working in laboratory glove box and collecting bioaerosol samples