



Australian Government
Department of Agriculture,
Fisheries and Forestry



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Background

Since July 2008, we have investigated the distribution and diversity of Hendra viruses in flying-fox populations in north-eastern Australia, supported by WEDPP, the Australian Biosecurity CRC for Emerging Infectious Diseases, Biosecurity Queensland and CSIRO AAHL. With three years of the proposed 5-year longitudinal study completed, we recently analyzed the data to date, in the course of preparing a manuscript.

Two key findings of the analysis form the basis of this proposal – the emerging temporal pattern of infection and the emerging spatial pattern of infection. The frequency of detections was statistically significantly higher in year two than in years one and three, indicating between-year variation in Hendra virus infection prevalence in flying-fox populations, and providing a biologically plausible explanation for why spillover to horses occurs in some years and not others. Additionally, when we collapsed the three years of data into a single 12-month period, we had positive detections in every month except April and December. This finding suggests that flying-foxes can excrete virus at any time of year, and that the apparent clustering of Hendra virus incidents in horses (70% have occurred June to October) reflects factors other than the presence of virus. The lack of any Hendra virus detection in flying-foxes in the Northern Territory suggests prevalence may be higher in Queensland flying-fox populations than elsewhere. Whether this difference truly reflects location, or is confounded by species or some other variable cannot be ascertained at this time, but the finding of different infection prevalence in flying-fox populations in different locations suggests a rationale for the geographic occurrence of Hendra spillover incidents.

In mid-2011, eighteen separate Hendra incidents (eight in NSW) occurred within an 8-week period. This event prophetically underlined the need for our proposed surveillance focus into NSW, and resulted in additional research funding. These sources include Biosecurity Queensland Hendra response funds to support real-time sampling and testing, CSIRO Australian Animal Health Laboratory personnel and in-kind support (for real-time sampling and testing), and September 2011, we received funding from the joint Hendra virus Taskforce to accelerate the research in Queensland and New South Wales. Thus, the QLD and NSW components of this WEDPP project (see items 1 and 2 below) are jointly funded.

Objectives

In this project, it was proposed to collect, analyse and synthesize

1. additional data from the established QLD and NT locations to improve the robustness of our between-year and within-year analyses;
2. data from new locations (NSW and WA) to better understand relative virus prevalence and diversity.