

## **Japanese Encephalitis Transmission Dynamics In Australia And The Philippines**

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Japanese encephalitis (JE) poses a significant risk to humans and animals, with transmission influenced by complex host interactions and geography. The disease is endemic in regions like the Philippines, while sporadic outbreaks occur in northern Australia.

A spatially explicit, stochastic, JE virus (JEV) model was developed and applied to the Northern Peninsula Area (NPA) of northern Australia and the Philippines. Parameters included host data (ardeid bird and feral pig abundance and distribution – derived from field surveys or imputed according to ecological niches), human demographic data, and mosquito data collected from land cover sites in both regions between 2023 and 2025, to derive vector abundance and distribution maps. The model was fitted to known JEV detections in both regions. JEV circulation patterns, sporadic outbreaks, endemicity, and epidemic spread, were investigated. Preventive strategies such as human vaccination, mosquito control, and feral pig culling were tested. A sensitivity analysis using variance-based techniques identified key transmission drivers.

Data collection and model development are ongoing, with results to be presented at the conference. These will include patterns of spatiotemporal circulation, risks associated with mosquitoes and host species by season and weather, and the impact of prevention strategies on human disease incidence. Results from our studies, such as the pig JEV seroprevalence study, which informed the model's development, will also be shared as appropriate.

This JEV transmission model will provide insights into potential transmission drivers in the NPA and the Philippines, offering guidance to public health agencies on effective prevention and control strategies.