ENVIRONMENTAL DRIVERS OF ROSS RIVER VIRUS IN SOUTH-EAST TASMANIA, AUSTRALIA: TOWARDS STRENGTHENING PUBLIC HEALTH INTERVENTIONS

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Background and aims: Ross River virus (RRV) is the most common and widespread mosquito-borne disease in Australia [1] and is predominantly identified and managed through passive surveillance. Here, the proactive use of environmental datasets to improve community-scale public health interventions in south-eastern Tasmania is explored. The potential for RRV to become an emerging public health issue in Tasmania due to projected climate changes is discussed.
Methods: RRV cases for the south-eastern Tasmania study area were obtained from the Tasmania Department of Health and Human Services (DHHS) for the 1993-2009 study period. Climate data (1993-2009) were obtained from the Australian Bureau of Meteorology (BOM) [2]. Tide data were obtained from the National Tidal Centre and Australian Hydrographic Service. Known environmental drivers (temperature, rainfall, and tide) of the RRV vector *Aedes camptorhynchus* were analyzed against cumulative case records for 5 adjacent Local Government Areas (LGAs) (1993-2009).
Results: Fisher's exact analysis showed years with above average rainfall were significantly correlated with [Tasmania-wide] RRV outbreak years. From Spearman's correlation, correlations between the five LGA RRV cases and three key environmental variables separately varied for 0, 1, 2 and 3 month lag periods. Negative binomial regression analyses showed that, allowing for a 0 to 3 month lag period, temperature was the most significant driver of RRV cases at 1 month lag, contributing to a 23.2% increase in cases above the long-term case average.
Conclusions: This research serves as an initial study of environmental drivers of RRV in SE Tasmania. Using these results for future studies and modeling to develop warning systems for local councils could prove very valuable. Implementing these early warning systems might help to prioritize funding towards interventions such as mosquito spray programs and/or public outreach campaigns. These steps will help to further guide public health policy and public health officials to reduce the overall disease burden.

References

1. Russell RC (2002) Ross River virus: ecology and distribution. Annual Reviews of Entomology 47: 1-31
2. Australian Bureau of Meteorology (Accessed January-April 2010) Climate data online. Available online at http://www.bom.gov.au/climate/data/index.shtml