

# Entomological Thresholds for Management of Dengue Epidemic in Kandy District of Sri Lanka

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Vector Control Entities (VCE) heavily depend on larval indices, namely; Premise Index (PI), Breteau Index (BI) and Container Index (CI) to guide the vector controlling activities in Sri Lanka. However, entomologically based cutoff values that define potential dengue outbreaks are rarely being used in Sri Lanka. Therefore, the present study was conducted to develop a set of reflective thresholds for larval indices to facilitate dengue epidemic management in four selected dengue high risk Medical Officer of Health (MOH) areas in the Kandy District. Monthly entomological surveillance activities were conducted in Kandy Municipal Council (KMC), Akurana, Gampola and Kundasale MOH areas from January, 2016 to June, 2018. Reported monthly values of BI for *Aedes aegypti* ( $BI_{agp}$ ) and *Aedes albopictus* ( $BI_{alb}$ ), PI and CI were collected from the relevant MOH offices, along with monthly reported dengue cases for the period of 2011 to 2018. Receiver Operating Characteristic (ROC) curves were used to assess the discriminative power of the larval indices to develop thresholds for dengue epidemic management. As indicated by the area under the ROC curve (AUC), only PI and  $BI_{agp}$  denoted significant associations with dengue epidemics at lag periods of one and two months.  $BI_{agp} \leq 3.0$  (Low Risk),  $4.2 \leq BI_{agp} < 5.3$  (Moderate Risk) and  $BI_{agp} \geq 5.3$  (High Risk) could be suggested as the average threshold values of BI, along with  $PI \leq 6.9$  (Low Risk),  $9.1 \leq PI < 11.8$  (Moderate Risk) and  $PI \geq 11.8$  (High Risk). These thresholds are strongly recommended to be practiced within the study areas to predict dengue epidemics and to catalyze vector controlling activities in Kandy.

**Keywords:** Vectorial capacity, Aedes, Larval, Diet