The application of spatial analyses to assist dengue control strategy at main public parks in Kuala Lumpur, Malaysia

Mohd Amierul Fikri M[1], Mohd Farihan MY[1], Faizul Akmal AR[1], Hanipah S[2]

[1]Institute For Public Health, Ministry of Health Malaysia, Malaysia, [2]Kuala Lumpur Health Department, Ministry of Health Malaysia, Malaysia

ABSTRACT

Introduction: The role of urban parks in viral transmission of dengue should not be underestimated, and urban parks should be included in current vector control programs. This study implemented spatial analyses in order to map and analyse the spatial distribution of Aedes sp breeding through a spatial statistics method. **Materials and methods:** Five main and popular public parks in Kuala Lumpur were selected based on high number of visitors and located within 400 metres radius from dengue outbreak localities in 2019. Entomological survey was done for 3 cycles at each park. Variables such as coordinates and characteristics of the water containers were also recorded during the survey. Two spatial statistical analysis; Average Nearest Neighbourhood (ANN) and hotspot analysis using Kernel Density estimation were performed to access spatial distribution of the *Aedes sp* breeding at each study site. **Results and conclusion:** ANN showed observed mean distance of Aedes sp. breedings for KL botanical park was 35.55 metre (z-score= - 6.18), Tasik Pemaisuri 61.19 metre (z-score = - 2.11), Tasik Titiwangsa 67.77 metre (z-score = 4.62), Kepong Metropolitan 110.14 metre (z-score = - 0.88) and Alam Damai 25.43 metre (z-score = -2.73). Based on the calculated z-score, this study found clustered breeding pattern at KL Botanical Garden, Tasik Pemaisuri and Alam Damai; dispersed pattern was observed at Tasik Titiwangsa and random pattern was found at Kepong Metropolitan. Hotspot maps were produced using Kernel Density estimation for each park. These hotspot maps offered important information on specific areas within each park to be targeted for dengue control measures. Our study showed that spatial statistical tools could be an effective means to establish the spatial density of dengue vectors in public parks. The mapping of dengue vectors would serve as guidance for public park management to identify sources of breeding and target areas within the parks for dengue control activities.