

## **Distribution of pesticide emission, deposition and transfer among pesticide sprayers in Malaysian Agriculture Subsectors**

### **ABSTRACT**

**Introduction:** Extensive use of pesticides appears to be one of the issues that affect the future roles of the agricultural economy, due to occupational disease and poisoning cases associated with pesticide exposure. Emission, deposition and transfer are three main routes involved in transporting pesticide from its sources to the skin surface. This current study was aimed to analyze the distribution of dermal exposure to pesticide on body parts. **Methods:** A total of 160 pesticide sprayers working in paddy, vegetable, cocoa, and oil palm plantations participated in this study. Dermal Exposure Assessment Method (DREAM) was used to evaluate dermal exposure to pesticide caused by emission, deposition and transfer routes. The Kruskal Wallis Test was used to identify the differences on exposure routes between agriculture sectors. **Results:** There was significant difference of total exposure through emission, deposition and transfer among sprayers in different farming sectors ( $p < 0.001$ ). Pesticide sprayers in paddy fields have the highest pesticide exposure through deposition ( $144.31 \pm 30.23$  DU) and transfer ( $30.54 \pm 1.19$  DU), particularly on upper body parts. Meanwhile, vegetable pesticide sprayers were exposed the most on lower body parts, caused by deposition of spray droplets from low crop spraying. Emission found to contribute the least of the total exposure among pesticide sprayers in all agriculture sectors, which may indicate less occurrence of major leaks, splashes and spills during pesticide spraying. **Conclusion:** This study provides insights of exposure assessment, where intervention strategies could be developed with priority given for exposure reductions from relevant exposure routes.

**Keyword:** Emission; Deposition; Transfer; Pesticide distribution