

UNIVERSITI TEKNOLOGI MARA

**RELATIONSHIP OF *Aedes* INDICES AND
DENGUE CASES IN TAWAU:
A TEN YEAR STUDY**

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Project submitted in fulfillment of the requirements for
the degree of
Bachelor in Environmental Health and Safety
(Hons.)

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DECLARATION BY STUDENT

Project entitled “Relationship of *Aedes* Indices and Dengue Cases in Tawau: A Ten Year Study” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Associate Professor Rodziah Ismail. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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TABLE OF CONTENT

TITLE PAGE	
DECLARATION BY STUDENT	ii
INTELLECTUAL PROPERTIES	iii
APPROVAL BY SUPERVISOR	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xii
ABSTRACT	xiv
ABSTRAK	xv
CHAPTER 1: INTRODUCTION	1
1.1 Background information	1
1.2 Problem statement	5
1.3 Study justification	10
1.4 Objective	12
1.4.1 General objective	12
1.4.2 Specific objectives	12
1.5 Study hypothesis	12
1.6 Conceptual framework	13
CHAPTER 2: LITERATURE REVIEW	14
2.1 History of dengue	13
2.2 Dengue fever in Malaysia	16
2.3 What is Dengue fever	17
2.4 Entomology of dengue	20

ABSTRACT

Dengue is currently the most important vector-borne disease globally – Malaysia is one such nation witnessing an increase of dengue incidence over the years. Entomological surveillances using *Aedes* indices (House index, Breteau index and Container index) is used to decide changes in the topographical dissemination and abundance of the vector, assess control programs, get relative estimations of the vector populace and encourage proper choices with respect to intervention. This study conducted was to assess whether there is any relationship between the *Aedes* indices and dengue incidence in Tawau, Sabah. A retrospective cohort study was conducted in this study. Ten years of data was collected from the Vector Control Unit, Tawau – dengue cases and *Aedes* indices reported in Tawau from 2008-2017. The dengue trend in Tawau was analysed descriptively using Microsoft Excel 2010. Subsequent analysis was then carried out on the data- testing correlations between the variables and their lags, prior to developing a regression model to further test the relationship between these variables. We observed the dengue trend in Tawau and found a fluctuating but generally upwards trend in dengue incidences. On the other hand, the *Aedes* indices have fluctuating trends over the study period but generally exhibited an increase as the year progresses. When these data were tested for correlation using the Spearman Rank test, several explanatory variables demonstrate a weak relationship with dengue cases over the period of 2008-2017, namely - House Index at a Lag of 6 weeks ($r=-0.167$), Breteau Index at a Lag of 1 weeks ($r=0.062$) and container index at a Lag of 1 weeks ($r=0.210$). In general, these variables prove to have no direct relationship with dengue cases. These variables were then further tested for a relationship using a Poisson regression distribution, of which all variables proved to have no significant relationship ($p\text{-value}>0.5$). Through this study, it has been showed that vector surveillance data cannot be consistently used to evaluate dengue transmission in Tawau. Dengue cases still occur at low *Aedes* indices and this may be due to other co-variates such as: - environmental conditions, populations density, diaspora, travelling waves, infrastructure available, rate of urbanization, vegetation index and possibly other factors may all play a coercive role in the transmission of dengue. Further study is required by all relevant parties, and a concerted push must be made to develop a more relevant and significant means of quantifying the magnitude of dengue transmission in Tawau- and as an extension, Malaysia.