

HAND, FOOT, MOUTH DISEASE (HFMD) HAZARD ZONATION BY
USING ANALYTICAL HIERARCHY PROCESS (AHP) AND FUZZY
ANALYTICAL HIERARCHY PROCESS (FAHP) IN SELANGOR

FATIN NUR AZLINA BINTI IBRAHIM

2021614964



COLLEGE OF BUILT ENVIRONMENT
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FATIN NUR AZLINA BINTI IBRAHIM

2021614964



**Thesis submitted to the Universiti Teknologi MARA Malaysia
in partial fulfilment for the award of the degree of the
Bachelor of Surveying Science and Geomatics (Honours)**

AUGUST 2023

DECLARATION

I declare that the work on this project/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA (UiTM). This project/dissertation is original, and it is the result of my work, unless otherwise indicated or acknowledged as referenced work.

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Name of Student : Fatin Nur Azlina Binti Ibrahim
Student's ID No : 2021614964
Project/Dissertation Title : Hand, Foot, Mouth Disease (HFMD) Hazard
Zonation by using Analytical Hierarchy Process
(AHP) And Fuzzy Analytical Hierarchy Process
(FAHP) in Selangor.
Signature and Date : 11/8/2023

Approved by:

I certify that I have examined the student's work and found that they are in accordance with the rules and regulations of the School and University and fulfils the requirements for the award of the degree of Bachelor of Surveying Science and Geomatics (Honours).

Name of Supervisor : Noorazwani Binti Mohd Razi
Signature and Date : 11/8/2023

ABSTRACT

Hand, Foot, Mouth Disease (HFMD) has been known mostly in Malaysia for a long time. Until now, effective chemoprophylaxis or vaccination approaches for dealing with HFMD are not available. HFMD is transmitted from one to others via direct contact with saliva, fluid from nose or blisters. In addition, it can also be caused by contact with food or water contaminated with fecal droplets, nose discharge, fluid, or saliva of the infectious person. Attempts to understand the disease are focused only on the study of medicine and public health or demographic distribution. The main objective of this research is to identify HFMD hazard zonation in Selangor by applying Analytical Hierarchy Process (AHP) and Fuzzy Analytical Hierarchy Process (FAHP) methodologies for weighting each spatial factor such as disease incidence, socio-economic and physical factors. The outputs of Analytical Hierarchy Process (AHP) and Fuzzy Analytical Hierarchy Process (FAHP) were input into a Geographic Information Systems (GIS) process for spatial analysis. Nine (9) criteria were selected for analysis as important factors which were disease incidence over 5 years from 2018 to 2022, population density, road density, building and facilities density and temperature. The results showed a consistency ratio (CR) value for these main criteria of 0.05046741 for Analytical Hierarchy Process (AHP), the CR for Fuzzy Analytical Hierarchy Process (FAHP) results was 0.14465517. As both remained within the threshold of 0.1, the CR value were acceptable. After linking to actual geospatial data (disease incidence 2022) through spatial analysis by GIS for validation, the results of the FAHP approach were found to match more accurately than those of the AHP approach. The zones with the highest hazard of HFMD outbreaks were in three main areas within the vicinity of Shah Alam, Hulu Langat, and Kuala Selangor district. The produced hazardous maps may be useful for organizing HFMD protection plans.

Keywords: Hand, Foot, Mouth, Disease (HFMD), Analytical Hierarchy Process (AHP), Fuzzy Analytical Hierarchy Process (FAHP), Hazard Zonation, Geographic Information System (GIS)

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