

UNIVERSITI TEKNOLOGI MARA

**SPATIAL TEMPORAL
DISTRIBUTION ANALYSIS
OF COVID-19 CASES
IN SARAWAK**

AZIZUL ASWAD BIN MAN

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ABSTRACT

In Malaysia, the first comprehensive analysis of COVID-19 epidemiology data was found to be spatiotemporally diverse. For a long time, very high-intensity non-pharmaceutical therapies have been utilized to limit transmission. Long-term mobility restrictions have not succeeded in disease containment owing to pandemic fatigue. Understanding the temporal and geographical patterns of COVID-19 infection is critical for properly allocating limited resources. This study aims to use geographic information systems (GIS) to study the spatial pattern and trends of COVID-19 cases in Sarawak from March 2020 to March 2023. The general objective of this study is to evaluate the variation pattern of COVID-19 in Sarawak from March 2020 to March 2023. The specific objective includes discussing the spatial and temporal distribution of COVID-19 cases from March 2020 to March 2023 in Sarawak to determine the level of the hotspot and cold spot a spatial cluster of COVID-19 cases from March 2020 to March 2023 in Sarawak and to discuss hotspot and cold spot spatial cluster in Sarawak. Next, the method used to conduct this study is geography and demography information of the study areas, data collection, spatial distribution, and spatial autocorrelation. The methods used in this study have explained the location of the study, how to collect data related to cases, determine the covid-19 case distribution of each region in the study location, and the relationship between the method of calculating the case distribution and specifying the cluster category.

In conclusion, the variation pattern of COVID-19 in Sarawak from March 2020 to March 2023 was evaluated. The results of the spatial distribution show clusters, while the global Moran shows that the incidence rate (IR) of the total COVID-19 cases was in a random pattern. The high negative spatial autocorrelation indicated distinct values clustered. COVID-19 infections have strong clusters in Kuching District. Throughout the epidemic, Kuching has been the COVID-19 disease epicenter in Sarawak. Approximately 35% of all COVID-19 conditions in Sarawak were diagnosed in Kuching from March 2020 to March 2023.

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TABLE OF CONTENTS

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
LIST OF NOMENCLATURE	xii
CHAPTER ONE : INTRODUCTION	1
1.1 Research Background	1
1.2 Motivation	2
1.3 Problem Statement	2
1.4 Objectives	3
1.4.1 General Objective	3
1.4.2 Specific Objective	3
1.5 Research Question	3
1.6 Hypothesis	3
1.7 Scope and Limitation	4
1.8 Significance of Study	4
CHAPTER TWO : LITERATURE REVIEW	5
2.1 Introduction	5
2.2 Overview of COVID-19 in Sarawak	5
2.3 The Importance of Understanding the Spatial-Temporal Distribution of Cases for Effective Public Health Responses.	5
2.4 Spatial-Temporal Distribution Analysis Methodologies	7
2.5 Challenges and Limitations	8

CHAPTER ONE: INTRODUCTION

1.1 Research Background

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has spread worldwide since the first case was reported in Wuhan, China, in December 2019. According to the World Health Organization (2022), the overall number of confirmed infected patients worldwide by July 10th, 2023, was 767,726,861, with a total death toll of 6,948,764. Malaysia has reported 5,078,592 cases, whereas Sarawak has reported 327,103, with 1,706 deaths as of July 8th, 2023. According to COVIDNOW (2022), the first occurrence was recorded in Sarawak on March 22nd, 2020. Efforts to contain the virus on a worldwide scale are still underway. However, due to the many unknowns surrounding the number of asymptomatic infections and the degree of pathogen transmissibility, the efficacy of these initiatives has yet to be thoroughly assessed. (Li et al., 2020) describe that the reproductive number of COVID-19 is more significant than in prior coronavirus outbreaks, whereas (Liu et al., 2020) explained that a considerable proportion of infected people is asymptomatic. As a result, it is unsurprising that the number of new confirmed cases and COVID-19-related deaths in most countries, including Malaysia, continues to rise.

Governments have relied on traditional public health interventions to slow the spread of the pandemic and minimize the number of new cases. A few researchers have explained that the significant purpose of such public health measures (such as quarantine, social distance, and community containment) has always been to prevent person-to-person transmission by physically separating (Wilder-Smith & Freedman, 2020). Even though Malaysia implemented several control measures (including physical distancing, home quarantine, public education encouraging people to wash their hands and wear masks in public, and local travel restrictions), the number of new cases confirmed nationally will continue to rise (WHO, 2021). Analyzing the number of confirmed cases and their period of occurrence is a crucial initial step in building a strategy and predictive modeling for COVID-19 in Sarawak. According to (Konstantinoudis et al., 2020), this spatial-temporal reasoning model is adequate for identifying high-risk locations and assisting in monitoring and preventative efforts.