

# MAPPING THE RISK FACTORS OF DENGUE FEVER WITHIN THE EPIDEMIOLOGIC TRIANGLE (AGENT-HOST-ENVIRONMENT) : A LITERATURE REVIEW 2020-2025

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## INTRODUCTION

Dengue fever is a global public health problem with rising incidence in both tropical and non-tropical regions. Over the last two decades, its distribution has widened, driven by globalization, rapid urbanization, cross-border mobility, and climate change. The epidemiology of dengue is influenced by risk factors within the epidemiologic triangle (agent-host-environment), including viral variation, host susceptibility, and environmental conditions that enable transmission.

## OBJECTIVE

To synthesize and map the risk factors of dengue fever (2020-2025) within the framework of the epidemiologic triangle.

## METHODOLOGY

A systematic search was conducted in PubMed, Scopus, and ProQuest to identify full-text English articles published between 2020-2025 that examined dengue risk factors. The search strategy applied a combination of MeSH terms, keywords, and Boolean operators. Twenty-one articles met the inclusion criteria and were analyzed.

## KEY FINDINGS

Determinants span all domains:

- Agent: Serotype variations (DENV-1, DENV-2) and ADE increase severity.
- Host: Age extremes, comorbidities, and pediatric factors heighten risk.
- Environment: Temperature, rainfall, standing water, housing density, and behavior drive transmission.

## SUMMARY OF DENGUE RISK FACTORS TRIANGLE BASED ON THE EPIDEMIOLOGIC TRIANGLE

Category	Key Risk Factors	Key Findings	Source
Agent	DENV-1 and DENV-2 serotypes; Antibody-Dependent Enhancement (ADE)	DENV-2 infection is associated with older age, a higher prevalence of comorbidities, and longer hospitalization duration. Secondary dengue infection aggravates clinical manifestations and increases risk of hospitalization and mortality.	Su et al., 2025; Tang et al., 2025
Host	Extreme age groups	Children under 10 years and elderly individuals over 60 years have a significantly higher risk of hospitalization and mortality.	Ferreira-Pereira et al., 2021
Comorbidities		Chronic conditions such as diabetes, hypertension, and chronic kidney disease are associated with an increased risk of complications and death.	Ferreira-Pereira et al., 2021
Neurological complications		Intracerebral hemorrhage (7.14%) and cerebral infarction (4.74%) were reported, with corresponding mortality rates of 50.0% and 51.5%.	Chang et al., 2023
Dengue Shock Syndrome in children		DSSS prevalence reached 96%, mainly associated with obesity, secondary infection, hepatomegaly, acidosis, and pleural effusion.	Munoz et al., 2025
Environment: Climate factors		Increased monthly maximum temperature and rainfall were significantly correlated with higher dengue incidence.	Wang et al., 2025
Household environment		Standing water, piped water supply, and mosquito exposure were associated with a dengue seroprevalence rate of 14.3%.	Muhammad et al., 2021
Behavioral and housing factors		Temporary residence (OR=10.2), daytime sleeping (OR=1.59-3.18), and high population density (OR=2.95-3.47) were identified as significant risk factors.	Rahman et al., 2022

## ANALYSIS

The integration of biological, host, and environmental determinants underscores the complex nature of dengue epidemiology.

## CONCLUSION

Dengue is a multifactorial disease shaped by the interaction of agent, host, and environment. This review highlights the need for integrative and evidence-based approaches grounded in the epidemiologic triangle to enhance prevention, optimize clinical management, and guide adaptive public health policies responsive to the evolving dynamics of dengue transmission.

