

# **Protocolo MSL: PREDIÇÃO DE CASOS DE CHIKUNGUNYA COM O USO DE *MACHINE LEARNING*: UM ESTUDO DE MAPEAMENTO SISTEMÁTICO DA LITERATURA**

A Chikungunya, também conhecida como CHIKV, é uma doença debilitante caracterizada por febre alta e dores intensas nas articulações, causada pelo vírus Chikungunya, um Alphavirus de RNA da família Togaviridae. Sua transmissão ocorre através da picada de mosquitos fêmeas, principalmente *Aedes aegypti* e *Aedes albopictus*. A natureza incapacitante da doença e seu potencial de disseminação rápida representam preocupações significativas para a saúde pública global. Nesse sentido, este estudo apresenta um Mapeamento Sistemático da Literatura (MSL), referente ao intervalo temporal entre 2010 a 2024 de estudos que apresentaram técnica de predição relacionados à Chikungunya e/ou arboviroses e em especial no Brasil.

## **1. Planejamento**

Levantamento do estado da arte para a predição de chikungunya.

### **PICOC**

- **Population:** chikungunya, arboviroses, vetores.
- **Intervention:** Artificial Intelligence, Machine Learning, Prediction.
- **Comparison:**
- **Outcome:**
- **Context:** model, approach, technique, method.

## **2. Questão de pesquisa**

- QP1 - quais as técnicas de Machine Learning (ML) relacionadas à predição de arboviroses, com foco na Chikungunya, estudadas durante a última década?

## **3. Palavras chaves**

Systematic Review; Prediction; Machine learning; Chikungunya; Arboviruses; Mapeamento Sistemático; Machine Learning; Artificial Intelligence.

## **4. String de busca**

**Estudos de revisão sistemática:** (systematic AND review AND ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning ) ) e ( ( artificial AND intelligence ) OR ( machine AND learning ) OR predictive AND arboviruses OR

vector-borne OR chikungunya AND systematic AND review ).

**Estudos de predição no Brasil:** ( ( brazilian OR brazil ) AND ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning ) ).

**Estudos gerais de predição:** ( ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning ) ).

## 5. Fontes de dados (indexadores)

- PubMed (<https://pubmed.ncbi.nlm.nih.gov/>);
- Scopus (<http://www.scopus.com>).

## 6. Critérios de elegibilidade

### 6.1 Critérios de inclusão:

- Estudos que apresentaram algum tipo de técnica de aprendizado de máquina relacionado à chikungunya e/ou arbovíroses;
- Estudos que apresentaram algum tipo de técnica de predição para chikungunya especificamente;
- Estudos de revisão sistemática e oriundos das revisões sistemáticas que estudaram predição para arbovíroses e/ou chikungunya (técnica *snowballing* [Moher, 2009]).

### 6.2 Critérios de exclusão:

- Artigos duplicados;
- Não apresenta um modelo, abordagem, técnica ou método para predição de chikungunya e/ou arbovíroses com uso de machine learning;
- Estudos não disponíveis para download;
- Não está em inglês ou português;
- Não está no intervalo de 2010 a 2024;
- Não está publicado em conferência, revista, jornal, ou capítulo de livro;
- Estudos de suporte clínico e genético ou de classificação (mosquito ou tipo de arbovíroses).
- Técnicas/modelos puramente matemáticos/estatísticos.
- Predição para outras doenças.

## 7. Digital Libraries Search Strings

BASE DE DADOS	STRING DE BUSCA	TOTAL DE ARTIGOS EXTRAÍDOS DA BASE

Scopus	TITLE-ABS-KEY ( systematic AND review AND ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning))	08
Scopus	TITLE-ABS-KEY ( ( artificial AND intelligence ) OR ( machine AND learning ) OR predictive AND arboviruses OR vector-borne OR chikungunya AND systematic AND review)	35
Scopus	TITLE-ABS-KEY ( ( ( chikungunya OR dengue OR zika ) AND ( prediction OR predictive OR machine OR learning ) AND sinan ) OR ( ( brazilian OR brazil ) AND ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning)))	17
Scopus	TITLE-ABS-KEY ( ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning ) )	119
PubMed	(systematic AND review AND ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning ) )	05
	( ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning ) ) Filters: from 2010 - 2024	55
	((chikungunya OR dengue OR zika) AND (prediction OR predictive OR machine OR learning) AND sinan) OR ( ( brazilian OR brazil ) AND ( chikungunya OR arboviruses ) AND ( prediction OR predictive OR machine AND learning ))) Filters: from 2010 - 2024	23
	TOTAL EXTRAÍDO DAS BASES	262
	ARTIGOS DUPLICADOS	94
TOTAL GERAL DE ARTIGOS ÚTEIS SELECIONADOS DAS BASES (Scopus + PubMed)		168
EXCLUÍDO APÓS LEITURA DO TÍTULO E ABSTRATO		15
INCLUÍDOS APÓS LEITURA COMPLETA		13

ACRESCENTADOS NA REVISÃO SISTEMÁTICA ATRAVÉS DA TÉCNICA <i>SNOWBALLING</i>	51
TOTAL DE ARTIGO NA REVISÃO SISTEMÁTICA	64

## 8. Planilha com as informações extraídas dos artigos

A partir da questão de pesquisa foi criada uma planilha para agrupamento das informações dos artigos aproveitados, conforme abaixo:

- Tipo de estudo;
- Título do trabalho;
- Principal autor;
- Ano de publicação;
- Conferência/Revista;
- Abordagem;
- Técnica.

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