

# CLIMATE CHANGE, ENVIRONMENTAL FACTORS AND DENGUE IN AFRICA

*Christine Giesen (1), Zaida Herrador Ortiz (2), Diana Gómez Barroso (2,3)*

*(1) Preventive Medicine Unit, Infanta Sofía University Hospital, Madrid (Spain), (2) National Epidemiology Centre, Carlos III Institute of Health, Madrid (Spain), (3) Centro de Investigación Biomédica en Red – Epidemiología y Salud Pública (CIBERESP) (Spain)*

## PURPOSE

The impact of climate change on the distribution of dengue rises controversy and debate; despite the existence of evidence about the effect of changes in certain environmental variables have on its epidemiology. Africa, where data on dengue is limited, is one of the continents most affected by climate change.

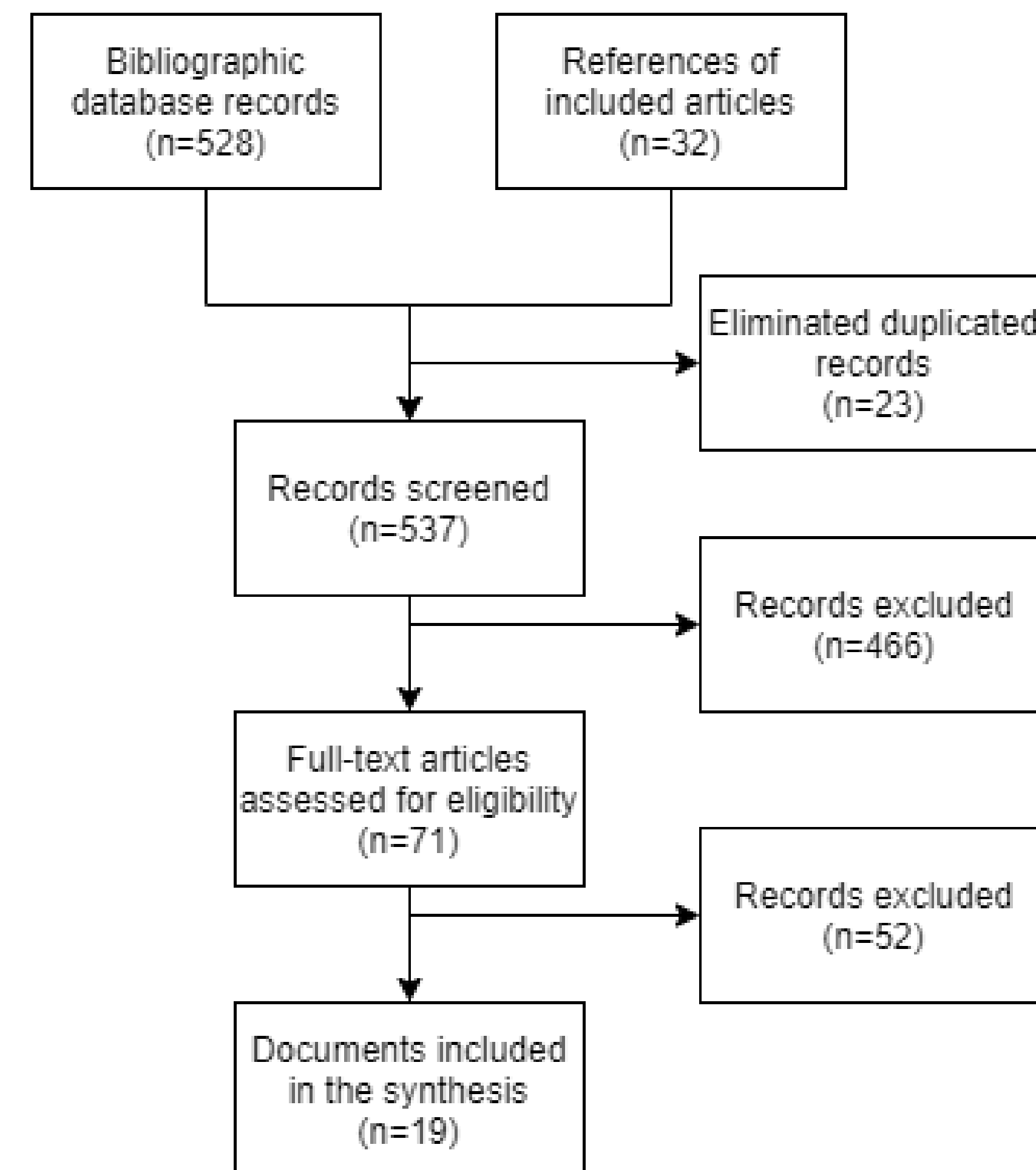
The objective is to evaluate the relationship between meteorological factors, climate change and dengue epidemiology in Africa through a systematic review.

The authors declare no conflict of interests.

## MATERIAL & METHODS

We carried out a systematic review considering all the articles indexed in PubMed, Scopus, Embase and CENTRAL. The study area was Africa. The disease under study was dengue and its vector *Aedes*. Standard terms for climate change and/or environmental factors were included in the search.

The review protocol was registered in PROSPERO.

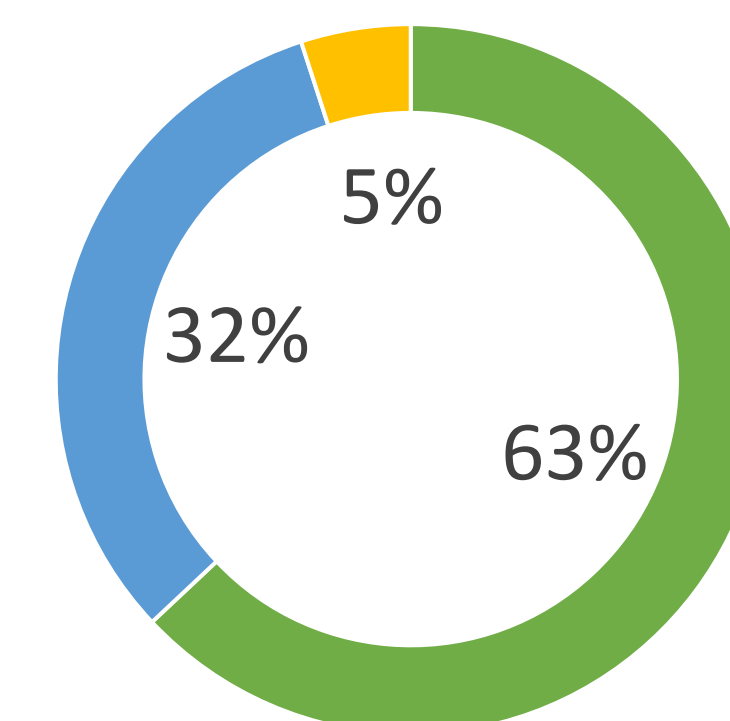


**Figure 1.** Flowchart of search strategy and included and excluded studies.

## RESULTS

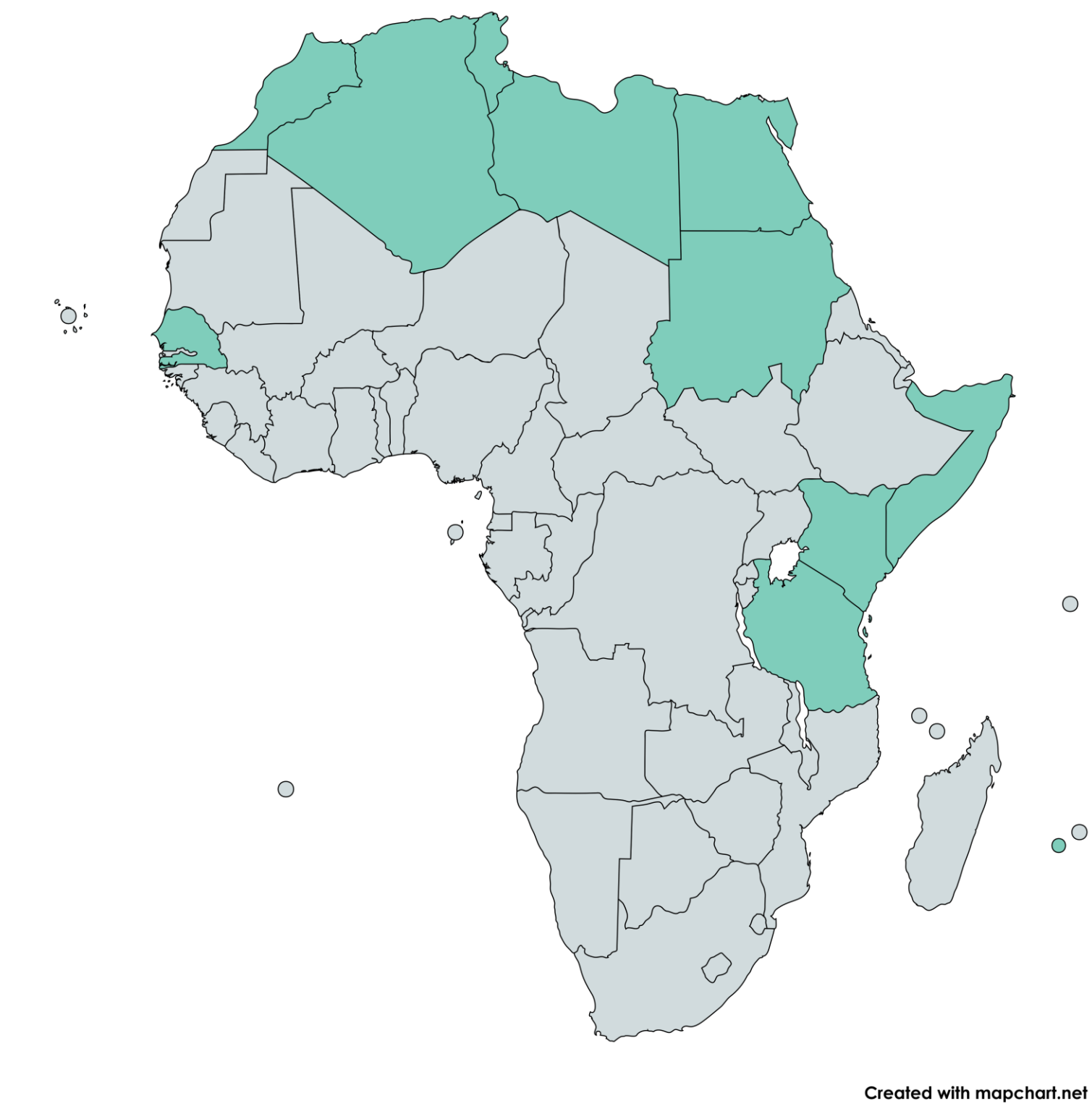
Nineteen studies met the inclusion and exclusion criteria, most of them using data on a global level (68%) and not just from Africa (figure 1). 47% concluded that climate change is affecting the prevalence and/or incidence of dengue, compared to 42% that did not find such a relationship. According to 37%, the prevalence of dengue will increase in the coming decades, while it will decrease according to 11%. Sixty three percent showed an increase in the spread of dengue (figure 2).

Temperature and rainfall were the most frequently analyzed environmental factors. Most studies scored 11-12 (good-very good) in the quality assessment.



■ Yes ■ No ■ Dependent on climate change scenario

**Figure 2.** Increased geographical dengue expansion in Africa (n=19).



**Figure 3.** Analyzed countries of included studies (n=19).

## CONCLUSIONS

Half of the studies showed a positive relationship between observed or predicted results and climate change. We observed methodological heterogeneity and most studies had important limitations. We believe that it would be necessary to improve the surveillance of this disease and standardize the study approach to be able to contrast in the long term the effect of climate change and environmental variables in the epidemiology of dengue in Africa.