

## Chikungunya Epidemiology

*Alison Bettis, Amol Chaudhari, Maina L'Azou Jackson, Gabrielle Breugelmans, Ana Goios, Margarita Riera, Estelle Meroc*

To enable PROSPERO to focus on COVID-19 registrations during the 2020 pandemic, this registration record was automatically published exactly as submitted. It has since been amended by the author and the PROSPERO team have checked the record for eligibility.

### Citation

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### Review question

1. Describe Chikungunya evolution over time (year, seasonality, genotype) and place (countries and regions (Africa, Americas, Asia, Middle East, Europe, Indian Ocean Islands, Oceania/Pacific Islands))
  - a. Identify regions or countries with epidemic/periodic transmission versus endemic circulation with sustainable transmission
  - b. By country, describe outbreaks characteristics especially in terms of place and frequency between successive epidemics and population at risk
2. Describe Chikungunya outbreaks (attack rates and incidence rates (laboratory confirmed or clinically assessed) by age groups and overall, length of outbreak from index case to last case, virus lineage, co-circulating virus...)
3. Describe Chikungunya seroprevalence and duration of infection-acquired immunity to better understand the susceptible population (and differences by regions)
4. Describe surveillance systems in place to understand representativeness of the currently available data (case definitions incl. laboratory testing, under-reporting)

### Searches

1. Criteria for including studies

The study inclusion criteria are based on the PICOS strategy:

Population: General population, all age groups, worldwide

Intervention: Chikungunya virus infection/disease

Comparison: Not applicable

Outcome:

- Incidence
- Attack Rate
- Infection seasonality
- Age distribution
- Risk factors
- Viral lineage
- Infection-acquired immunity duration
- Concomitant infections
- Seroprevalence
- Surveillance systems

Study design: Observational studies including, surveillance data, outbreak investigations, cross-sectional study, cohort study, case-control study, amongst others

2. Exclusion criteria

The studies will be excluded from the SLR if they meet one or more of following criteria:

- i. Studies pertaining to diagnostics development, health economics, social sciences, case reports/series, authors opinions and review papers (however, original studies included in the review papers complying with the inclusion/exclusion criteria will be included).
- ii. Non-human data (animal studies, entomological studies, in vitro/vivo studies, preclinical)
- iii. Studies published before 01/01/1999 (i.e. outbreak in DRC).
- iv. Studies in another language than English, Spanish, Portuguese, or French.
- v. Studies focusing exclusively on imported-cases of CHIKV.

### 3. Information sources

#### 3.1 Electronic databases

We will conduct a literature search in MEDLINE (via PubMed), LILACS, SciELO and African Index Medicus to obtain peer-reviewed, scientific publications related to the review.

#### 3.2 Reference checking and hand searching

The reference list of relevant studies retrieved from the electronic database search will be hand searched to identify additional studies.

#### 3.3 Grey literature selection

Data in the public domain pertaining to the objective of this study, outbreak investigation reports, surveillance guidelines and surveillance data will be obtained via WHO, PAHO, SEARO, WPRO, WHOLIS, US-CDC, ECDC, Pro-Med, Google Scholar and national public health institutes/reference microbiology laboratories websites from CHIKV-endemic countries.

# Search string # of results

1 Chikungunya[Title/Abstract] AND ("1999/01/01"[PDat] : "2020/04/14"[PDat]) 4762

2 #1 AND ((Chikungunya[Title/Abstract] AND ( "1999/01/01"[PDat] : "3000/12/31"[PDat] ))) AND  
 (((((((((((((((((((((((((((((((("attack rate") OR "attack rates") OR incidence) OR "incidence rate") OR  
 "incidence rates") OR season) OR seasonality) OR "risk factors") OR "risk factor") OR stratification) OR age)  
 OR transmission) OR "viral lineages") OR "viral lineage") OR lineages) OR clades) OR genotypes) OR  
 "natural infection") OR "infection-acquired immunity") OR "natural immunity") OR coinfection) OR  
 coinfections) OR "concomitant infection") OR "concomitant infections") OR co-circulate) OR co-circulation)  
 OR serology) OR seroprevalence) OR serosurvey) OR serosurveys) OR surveillance) OR "surveillance  
 system") OR monitoring) OR representativeness) OR under-reporting) OR underreporting) AND (  
 "1999/01/01"[PDat] : "3000/12/31"[PDat] )) Filters: Publication date from 1999/01/01 3128

### Types of study to be included

Observational studies including, surveillance data, outbreak investigations, cross-sectional study, cohort study, case-control study, amongst others

### Condition or domain being studied

Chikungunya virus infection/disease

### Participants/population

General population, all age groups, worldwide

### Intervention(s), exposure(s)

Chikungunya virus infection/disease

### Comparator(s)/control

Not applicable

### Main outcome(s)

Incidence

Attack Rate

Prevalence

Seroprevalence

\* Measures of effect

frequency, proportion

Additional outcome(s)

- Risk factors
- Infection seasonality
- Age distribution
- Viral lineage
- Infection-acquired immunity duration
- Concomitant infections
- Surveillance systems

\* Measures of effect

stratification of main outcomes

Data extraction (selection and coding)

Data from the eligible full-text papers identified will be extracted using a standardized extraction form in MS Excel (see Annex) to ensure that all relevant data are collected systematically. In addition, the section of the pdf manuscript from where data will be collected will be noted and/or highlighted. The template will be piloted with 10 studies and modifications made if necessary.

Risk of bias (quality) assessment

To decrease the risk of selection bias, two P95 reviewers will independently review the list of references obtained by screening key words in title/ /abstract to identify studies that fulfill the above-mentioned selection criteria. Discrepancies will be discussed, and if not resolved, a third reviewer will take the final decision.

In the second phase, full papers will be assessed for eligibility by a single reviewer. A second reviewer will independently examine a random sample of 10% of the full papers (a sample will be drawn from the list of selected papers using the R software) for eligibility. If a disagreement between the two reviewers would be of more than 10% of the random sample, the second reviewer will complete the full assessment of all papers independently and resolve any inconsistencies with the first reviewer. If discrepancies are not resolved, a third reviewer will take the final decision.

Re-extraction of 10% of the papers will be done by a second independent reviewer as a quality control measure.

CEPI will be involved in the validation of the SLR process at key checkpoints. CEPI will review the following lists shared by P95 as soon as available: 1. studies selected for title/abstract screening, 2. studies selected for full-text screening and 3. studies selected for data extraction.

Strategy for data synthesis

Using the data collected with the data extraction form, a qualitative data synthesis of results will be

performed for each specific outcome; More specifically, incidence numbers will be synthesized by country, taking into account potential stratification available (region within countries, case definition(s), season, age group, etc). A narrative review will be prepared, and the different findings will be synthesized for each country using tables summarizing results by Region( such as table 1, as well as descriptive plots like bar plots, boxplots, types of epidemic curves, etc.

If data are appropriate for quantitative synthesis, data will be collated in summary tables and, where possible, attack rate and incidence rate will be calculated based on population data.

### Analysis of subgroups or subsets

NA

### Contact details for further information

Estelle Meroc  
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### Organisational affiliation of the review

P-95

### Review team members and their organisational affiliations

Dr Alison Bettis. CEPI  
Dr Amol Chaudhari. CEPI  
Dr Maina L'Azou Jackson. CEPI  
Dr Gabrielle Breugelmans. CEPI  
Dr Ana Goios. P-95  
Dr Margarita Riera. P-95  
Dr Estelle Meroc. P-95

### Type and method of review

Epidemiologic, Narrative synthesis, Systematic review

### Anticipated or actual start date

12 June 2020

### Anticipated completion date

30 November 2020

### Funding sources/sponsors

This study was funded by the Coalition for Epidemic Preparedness Innovations (CEPI). Estelle Méroc, Ana Goios and Margarita Riera have received consulting fees from CEPI.

### Conflicts of interest

None known

### Language

English

### Country

Belgium, Norway, Portugal, Spain

### Stage of review

Review Ongoing

### Subject index terms status

Subject indexing assigned by CRD

### Subject index terms

Chikungunya Fever; Chikungunya virus; Dengue; Humans

**Date of registration in PROSPERO**

24 July 2020

**Date of first submission**

23 June 2020

**Stage of review at time of this submission**

<b>Stage</b>	<b>Started</b>	<b>Completed</b>
Preliminary searches	Yes	No
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	No
Data extraction	Yes	Yes
Risk of bias (quality) assessment	No	No
Data analysis	No	No

**Revision note**

Review status updated. Persons previously wrongly in 'collaborators' section are now added in Review team.

*The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.*

*The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.*

**Versions**

24 July 2020

27 January 2021

27 January 2021

**PROSPERO**

This information has been provided by the named contact for this review. CRD has accepted this information in good faith and registered the review in PROSPERO. The registrant confirms that the information supplied for this submission is accurate and complete. CRD bears no responsibility or liability for the content of this registration record, any associated files or external websites.