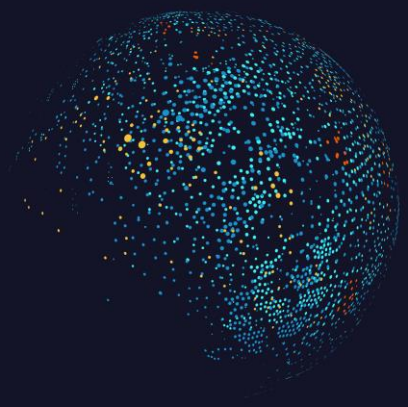
Additional Mpox parameters to support modelling and analysis

August 2024



BACKGROUND

The EpiParameter community is a global collaborative working group coordinated by the World Health Organization (WHO), with the aim of establishing an easy-to-use repository of epidemiological parameters accessible by modelers, epidemiologists, subject matter experts and decision makers, to inform mathematical models and other epidemiological analyses and, by extension, public health preparedness and response.

Given the ongoing multi-country Mpox outbreak, a brief extraction of Mpox parameters was undertaken, covering studies already parameterized in the {epiparameter} R package and other publicly available sources. The parameters and data structures provided in this guidance note have been driven and supported by our community partners (see last page of document). This product is one of the key components of the forthcoming Global Repository of Epidemiological Parameters (GREP). The GREP minimum viable product will be made available in early 2025.

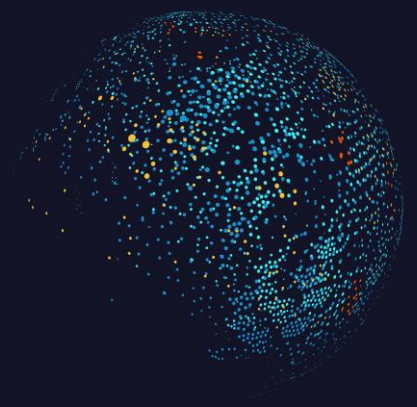
Please note that this is an experimental product currently under development.

AVAILABLE PARAMETERS FOR MPOX ANALYSIS

Parameter label	Definition	Example options (based on what is currently in the repository)
PATHOGEN_FK	Selected parameter of interest	Mpox
PARAM_TYPE_FK	Parameter type	Human delay, Reproduction number (Basic R0)
PARAM_SUBTYPE_FK	Parameter sub-type	Incubation period, generation time, All Reproduction number (Basic R0), serial interval
CLADE	Disease clade	I, IIa, IIb
PARAM_UNIT_FK	Parameter units	Days, No units
PARAM_VAL	Value of the selected parameter	
PARAM_BOUND_LOWER (PARAM_BOUND_UPPER)	Lower/upper bound of the parameter estimate	
PARAM_VALUE TYPE	Value category	Mean, Median
POP_SEX_FK	Gender filter	Male, Both
POP_AGE_MIN (POP_AGE_MAX)	Minimum/Maximum age of the study population	Min: 20, 23, 28; Max: 61, 64, 71
POP_COUNTRY	Country the estimate was produced from	Netherlands, United States, Democratic Republic of Congo, United Kingdom
ARTICLE_LABEL	First author and year of the study	
ARTICLE_TITLE	Title of the study	

Additional Mpox parameters to support modelling and analysis

August 2024



ACCESSING PARAMETERS IN R

To access the mpox parameters, first ensure you have installed the required packages:

```
library(httr)        library(tidyverse)
library(jsonlite)    library(pander)
library(rlist)
```

The core table can then be accessed via the GET() function via the public xmart-api-public-uat.who.int portal:

```
##--Load tables--##
response1 <- GET("https://xmart-api-public-uat.who.int/COLLAB/MPOX_PARAMETERS")

#FACT_PARAMETERS
json1 <- content(response1, "text")
FACT_PARAMETERS <- data.frame(fromJSON(json1))

#Tidy column names
FACT_PARAMETERS <- FACT_PARAMETERS %>% rename_with(str_sub, start = 7L)
```

An example of a Mpox parameter extraction query has been provided below.

```
Ex <- subset(FACT_PARAMETERS, PATHOGEN_FK == 'Mpox' &
               PARAM_TYPE_FK == 'Human delay' &
               PARAM_SUBTYPE_FK == 'incubation period' &
               PARAM_UNIT_FK == 'Days')

Result <- data.frame(Ex$ARTICLE_LABEL, Ex$PARAM_VAL, Ex$PARAM_BOUND_LOWER,
Ex$PARAM_BOUND_UPPER, Ex$PARAM_VALUE_TYPE_FK, Ex$POP_COUNTRY)

colnames(Result) <- c("Article label", "Parameter value", "Lower bound", "Upper
bound", "Value type", "Country")

Result
```

```
## Article label | Parameter value | Lower bound | Upper bound | Value type | Country
##  Miura 2022   |      8.50       |    6.60     |    10.90    |    Mean    |Netherlands
## Charniga, 2022|      7.60       |    6.20     |     9.70    |    Mean    |United States
                                        ...
```

WORK WITH US

The EpiParameter community is currently in the process of refining the proof of concept of the Global Repository of Epidemiological Parameters (GREP) in the coming months. The GREP will be a centralised repository of epidemiological parameters commonly used in models and analysis of disease outbreaks. This repository is intended to be accessible by modelers, epidemiologists, subject matter experts and decision makers to support decision making and outbreak preparedness.

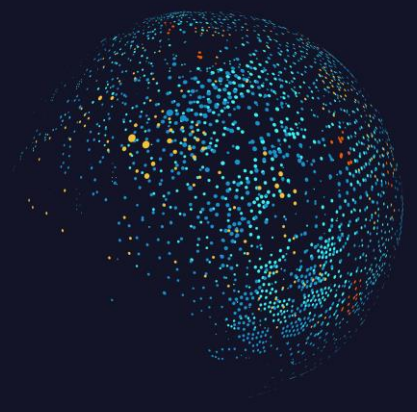
There are several ways you can support this initiative:

- If you have a study or parameter estimate for Mpox that you would like to include in the parameter repository, please email us at Collaboratory@who.int.
- If you would like to be involved in future meetings, discussions or general activities related to the EpiParameter community please join our community or alternatively send an email to Collaboratory@who.int to request access to our community site.

Please note that this is an experimental product currently under development.

Additional Mpox parameters to support modelling and analysis

August 2024



EPIPARAMETER COMMUNITY OF PRACTICE PARTNERS

The EpiParameter community is an inclusive, interdisciplinary and multisectoral global network of mathematical modelers, epidemiologists, librarians, information specialists, disease experts, decision makers and software developers. Community members span academia, NGOs, industry, and national and international public health agencies. The core working group consists of the below experts.

Institution	Name	Role
World Health Organization	**Julia Fitzner**	Collaboratory team lead
	Patricia Ndumbi	EpiParameter Community lead
	Chloe Rice	Community sub-lead
	Prabasaj Paul	Community and technical support
	Finlay Campbell	Community and technical support
	Mia Zivkovic	Technical product development
	Robin Panganiban	Technical product development
Government of Canada	**Lisa Waddell (Public Health Agency)**	SME knowledge and evidence synthesis
London School of Hygiene & Tropical Medicine	**Adam Kucharski**	SME infectious disease modelling
	Joshua Lambert	SME infectious disease modelling
	Carmen Tamayo Cuartero	SME infectious disease modelling
Imperial College London Website	**Anne Cori**	SME infectious disease modelling
	Ruth McCabe	SME infectious disease modelling

The community has a membership of +100 people, from institutions across the globe, including: CERN, data.org, Epicentre, European CDC, Gates Foundation, Hong Kong University, Imperial College London, John Hopkins University, London School of Hygiene and Tropical Medicine, Oxford University, Public Health Agency of Canada, United Kingdom Health Security Agency, University of Cape Town, University of Melbourne, Wellcome and more.