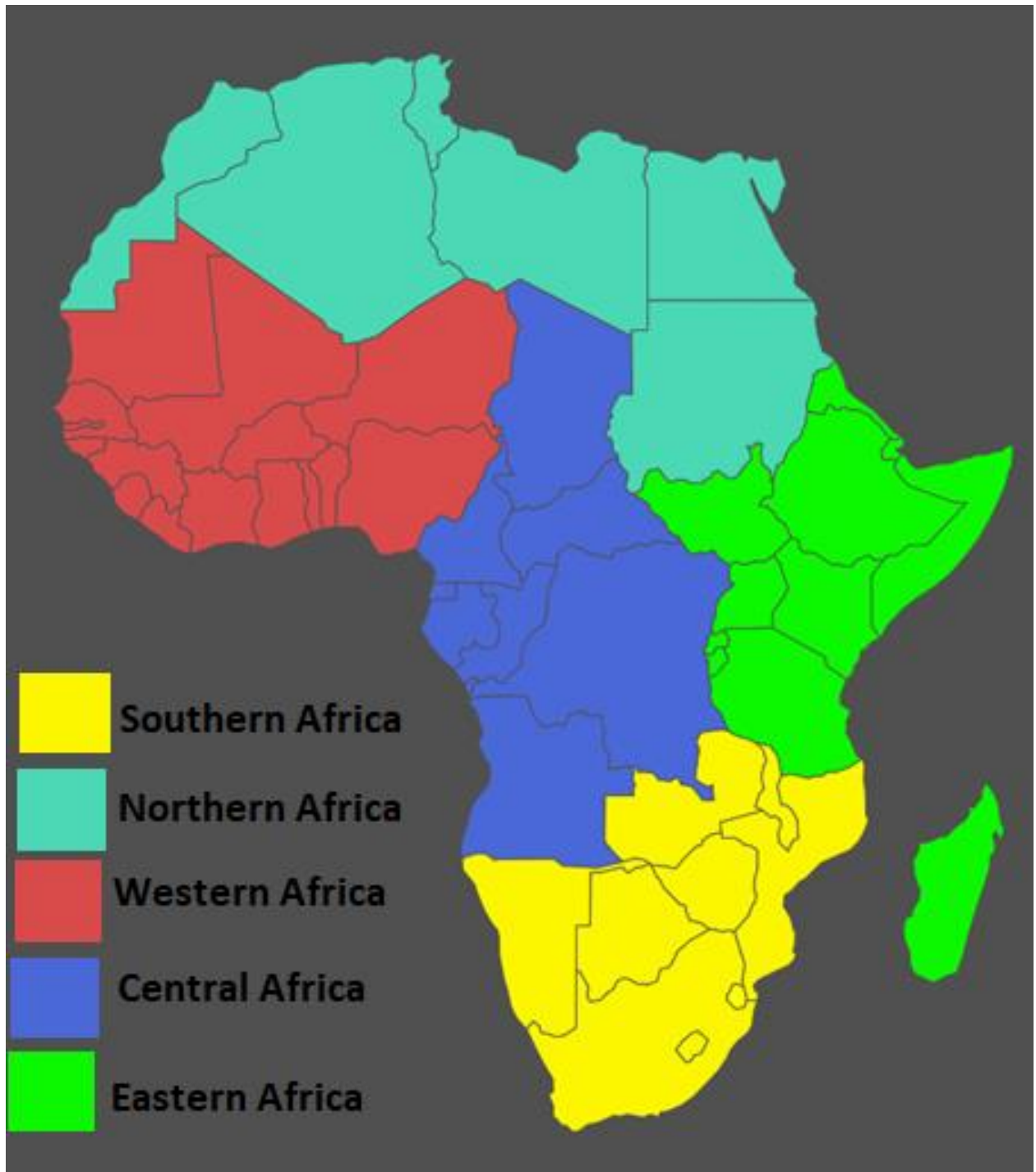


Supplementary Table S1. PRISMA checklist.

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 7, Lines 153-157
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 7, Lines 159-166
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 9, Lines 192-206
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 8, Lines 181-183
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 8, 183-191
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pages 9-10, Lines 210-220
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Pages 9-10, Lines 210-216
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 11, Lines 253-254
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 11, Lines 255-259
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 11, Lines 240-251
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Page 12, Lines 262-264
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Figure 1

Section and Topic	Item #	Checklist item	Location where item is reported
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Pages 11-12, Lines 255-259
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Pages 10-11, Lines 221-237
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 12, Lines 261-277
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 12, Lines 265-270
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	NA
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	NA
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 12, Lines 266-277
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 14, Lines 316-319
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Figure 1
Study characteristics	17	Cite each included study and present its characteristics.	Supplementary File 4, Table S4
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Supplementary File 2, Table S4
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Figures 2-3
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Pages 14-15, Lines 319-332
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Pages 17-18, Lines 376-396
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Pages 18-19, Lines 398-431
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	NA

Section and Topic	Item #	Checklist item	Location where item is reported
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NA
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Pages 17-18, Lines 378-396; Figures 2-3
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pages 19-20, Lines 439-445
	23b	Discuss any limitations of the evidence included in the review.	Pages 22-23, Lines 512-522
	23c	Discuss any limitations of the review processes used.	Pages 22-23, Lines 512-514
	23d	Discuss implications of the results for practice, policy, and future research.	Page 23, Lines 523-537
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 8, Lines 175-179
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Figure 1
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	NA
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	
Competing interests	26	Declare any competing interests of review authors.	
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	



Supplementary Figure S1. Spatial distribution of included studies reporting mosquito identification and prevalence of WNV, RVFV, and CHIV infections across Africa, generated using the Pixel Map Generator (amCharts).

Supplementary Table S2. PICO search terms.

Search	Domain	Query
Participants		
#1	Mosquito	Aedes
#2		Aedes aegypti
#3		Aedes albopictus
#4		Culex
#5		mosquito
#6		mosquitoes
#7		#1 OR #2 OR #3 OR #4 OR #5 OR #6
Phenomenon of interest		
#8	Virus	arbovirus
#9		arboviruses
#10		arthropod-borne virus
#11		arthropod-borne viruses
#13		West Nile Virus OR WNV
#14		Rift Valley Fever Virus OR RVFV
#15		Chikungunya Virus OR CHIV
#16		#8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16
Context		
#17	Study Area	Africa
#18		African
#19		African Countries
#20		Africa* OR Algeria OR Angola OR Benin OR Botswana OR "Burkina Faso" OR Burundi OR Cameroon OR "Canary Islands" OR "Cape Verde" OR "Central African Republic" OR Chad OR Comoros OR Congo OR "Democratic Republic of Congo" OR Djibouti OR Egypt OR "Equatorial Guinea" OR Eritrea OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR "Guinea Bissau" OR "Ivory Coast" OR "Cote d'Ivoire" OR Jamahiriya OR Kenya OR Lesotho OR Liberia OR Libya OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Mayotte OR Morocco OR Mozambique OR Namibia OR Niger OR Nigeria OR Principe OR Reunion OR Rwanda OR "Sao Tome" OR Senegal OR Seychelles OR "Sierra Leone" OR Somalia OR "South Africa" OR "South Sudan" OR "St Helena" OR Sudan OR Swaziland OR Tanzania OR Togo OR Tunisia OR Uganda OR "Western Sahara" OR Zaire OR Zambia OR Zimbabwe OR "Central Africa" OR "Central African" OR "West Africa" OR "West African" OR "Western Africa" OR "Western African" OR "East Africa" OR "East African" OR "Eastern Africa" OR "Eastern African" OR "North Africa" OR "North African" OR "Northern Africa" OR "Northern African" OR "South African" OR "Southern Africa" OR "Southern African" OR "sub Saharan Africa" OR "sub Saharan African" OR "sub Saharan Africa" OR "sub Saharan African"
#21		#17 OR #18 OR #19
#22		#7 OR # 16 OR # 20

Supplementary Table S3. The Joanna Briggs Institute (JBI) Prevalence Critical Appraisal Tool for the risk of bias in the included studies. Studies with 7–10 “yes” answers were ranked as “low risk”, those with 4–6 as “moderate risk”, and those with 1–3 as “high risk”.

Study	1. Was the sample representative of the target population?	2. Were study participants recruited in an appropriate way?	3. Was the sample size adequate?	4. Were the study subjects and the setting described in detail?	5. Is the data analysis conducted with sufficient coverage of the identified sample?	6. Were objective, standard criteria used for the measurement of the condition?	7. Was the condition measured reliably?	8. Was there appropriate statistical analysis?	9. Are all important confounding factors/ subgroups/ differences identified and accounted for?	10. Were subpopulations identified using objective criteria?	Overall score (out of 10)	Risk of bias*
Asaid et al [1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Benbetka et al [2]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Diallo et al [3]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Diallo et al [4]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Faulde et al [5]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Guggemos et al [6]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
LaBaud et al [7]	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	9	Low
MacIntyre et al [8]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Mohamed et al [9]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Monasitri et al [10]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Mossel et al [11]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	8	Low
Ndiaye et al [12]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Ndione et al [13]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Ochieng et al [14]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Orba et al [15]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Solima et al [16]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	8	Low
Crabtree et al [17]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Turell et al [18]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Wasfi et al [19]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low

Studies	1. Was the sample representative of the target population?	2. Were study participants recruited in an appropriate way?	3. Was the sample size adequate?	4. Were the study subjects and the setting described in detail?	5. Is the data analysis conducted with sufficient coverage of the identified sample?	6. Were objective, standard criteria used for the measurement of the condition?	7. Was the condition measured reliably?	8. Was there appropriate statistical analysis?	9. Are all important confounding factors/ subgroups/ differences identified and accounted for?	10. Were subpopulations identified using objective criteria?	Overall score (out of 10)	Risk of bias*
Faye et al [20]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Hanafi et al [21]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Lutomiah et al [22]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Mbanzulu et al [23]	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	8	Low
Nsengimana et al [24]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Ratovonjato et al [25]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Sang et al [26]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Seufi and Galal [27]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Shoemaker et al [28]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Sow et al [29]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Stoek et al [30]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Tantely et al [31]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
van den Bergh et al [32]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Bimiswa et al [33]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Caron et al [34]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Diallo et al [35]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	9	Low
Hein et al [36]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Lutomiah et al [37]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Pages et al [38]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Patrick et al [39]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Selhorst et al [40]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Sow et al [41]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low
Weggheleire et al [42]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Low

Supplementary Table S4. Included studies

No	Reference	Total no. of positive pools	Total no. tested	Country	Study region	Geographical region	Year of mosquito collection	No. of days of capture	Season (Wet/Dry)	Collection method	Virus screening method	Mosquito pools tested	Mosquito pools testing positive	No. of individual mosquitoes tested	No. of Individual mosquitoes testing positive
WNV															
1	(Assaid et al., 2020)	1	146	Morocco	NA	Both Rural and Urban	2018	8	Both Wet and Dry	CDC light traps baited with CO ₂	High-throughput real-time RT-PCR	146	1	1455	1
2	(Benbetka et al., 2018)	1	33	Algeria	NA	Rural	2015	3	Wet	CDC light traps	Cell culture and RT-PCR	33	1	.	.
3	(Diallo et al., 2005)	30	517	Senegal	WA	Rural	1998	5	Warm	CDC light traps baited with CO ₂	Indirect immunofluorescence (IIF) with immune ascitic fluid (IAF)	517	30	22992	30
4	(Diallo et al., 2019)	5	945	Senegal	WA	Rural	2013	162	Both Wet and Dry	CDC light traps baited with CO ₂	Indirect immunofluorescence using in-house hyper-immune mouse ascites fluids	945	5	14651	.
5	(Faulde et al., 2012)	789	11592	Egypt	NA	Both Rural and Urban	2010-2012	6	Dry	CDC light traps, BG-sentinel traps baited with BG-Lure	Real-time RT-PCR	18	.	11592	789
6	(Guggemos et al., 2021)	2	1021	Namibia	SA	Conservancy	2018-2020	25	Wet	BG-sentinel traps baited with BG-Lure, CDC light traps, CDC gravid trap	Generic RT-PCR	1021	2	10206	.
7	(LaBeaud et al., 2011)	19	105	Kenya	EA	Both Rural and Urban	2006-2007	13	Wet	CDC light traps	PCR, and qRT-PCR	105	19	920	.

No	Reference	Total no. of positive pools	Total no. tested	Country	Study region	Geographical region	Year of mosquito collection	No. of days of capture	Season (Wet/Dry)	Collection method	Virus screening method	Mosquito pools tested	Mosquito pools testing positive	No. of individual mosquitoes tested	No. of Individual mosquitoes testing positive
8	(MacIntyre et al., 2023)	16	1471	South Africa	SA	Urban and Conservancy	2011-2018	183	Wet	Non-toxic lure-baited BG-sentinel, CO ₂ -baited CDC miniature light traps (incandescent, LED, UV white and UV black), mosquito net with hand-held aspirators	RT-PCR	1471	16	40731	379
9	(Mohamed et al., 2020)	10	17	Sudan	NA	Urban	2016-2017		Dry	Aspirators	RT-PCR	17	10	4352	.
10	(Monastiri et al., 2018)	4	25	Tunisia	NA	Both Urban and Rural	2011-2014	24	Wet	CDC light trap	RT-PCR	25	4	583	.
11	(Mossel et al., 2017)	1	615	Uganda	EA	Conservancy	2008-2009	2	Dry	CDC light traps baited with CO ₂ , CDC gravid traps	RT-PCR	615	1	13355	.
12	(Ndiaye et al., 2018)	31	1323	Senegal	WA	Rural	2012-2013	60	Dry	Animal and light-baited traps, mosquito net-baited traps, CDC Light traps baited with CO ₂	Indirect immunofluorescence using in-house hyper-immune mouse ascites fluids (after inoculating on Vero cells)	1323	31	14984	.

No	Reference	Total no. of positive pools	Total no. tested	Country	Study region	Geographical region	Year of mosquito collection	No. of days of capture	Season (Wet/Dry)	Collection method	Virus screening method	Mosquito pools tested	Mosquito pools testing positive	No. of individual mosquitoes tested	No. of Individual mosquitoes testing positive
13	(Ndione et al., 2022)	41	13009	Senegal	WA	Rural	2012-2020	108	Dry	Backpack aspirator, CDC light traps	Indirect immunofluorescence assay using in-house hyperimmune mouse ascites fluids, complement fixation and seroneutralization tests and RT-PCR	13009	41	.	.
14	(Ochieng et al., 2013)	5	15890	Kenya	EA	Rural	2007-2012	.	Dry	CDC light traps baited with CO ₂ , landing collection methods	Cell culture and RT-PCR	15890	5	450000	.
15	(Orba et al., 2018)	1	67	Zambia	SA	Both Rural and Urban	2014 and 2016	10	Dry	CO ₂ baited-trap and BG-sentinel trap	Cell culture and RT-PCR	67	1	1037	.
16	(Soliman et al., 2010)	15	5014	Egypt	NA	Rural	1999-2002	144	Dry	CDC light traps baited with CO ₂	Cell culture and RT-PCR	5014	15	112155	.
17	(Crabtree et al., 2009)	1	2651	Kenya	EA	.	2006-2007	.	Wet	CDC light traps baited with CO ₂	RT-PCR	2651	1	.	.
18	(Turell et al., 2002)	30	36024	Egypt	NA	Rural	1993	11	Dry	Aspirators, ovitraps, miniature light traps baited with CO ₂	Cell culture and RT-PCR	.	.	36024	30
19	(Wasfi et al., 2016)	7	21	Tunisia	NA	Rural	2014	3	Dry	CDC light traps	RT-PCR	21	7	102	.
RVFV															
20	(Diallo et al., 2005)	63	569	Senegal and Mauritania	WA	Rural	1998	5	Warm	CDC light traps (some with CO ₂ -bait)	Indirect immunofluorescence (IIF) with immune	569	63	29018	.

No	Reference	Total no. of positive pools	Total no. tested	Country	Study region	Geographical region	Year of mosquito collection	No. of days of capture	Season (Wet/Dry)	Collection method	Virus screening method	Mosquito pools tested	Mosquito pools testing positive	No. of individual mosquitoes tested	No. of Individual mosquitoes testing positive
											ascitic fluid (IAF)				
21	(Faye et al., 2014)	4	2736	Mauritania	WA	Rural	2010	1	Warm/Dry	Animal-baited traps	Cell culture and RT-PCR	85	.	2736	4
22	(Hanafi et al., 2011)	3	297	Egypt	NA	Rural	2003	27	Warm/Dry	CDC light traps baited with dry ice	Cell culture and RT-PCR	297	3	9179	.
23	(LaBeaud et al., 2011)	23	105	Kenya	EA	Urban and Rural	2006-2007	12	Warm/Wet	CDC light trap	PCR and qRT-PCR	105	23	890	.
24	(Lutomiah et al., 2014)	18	771	Kenya	EA	Rural	2006 and 2007	2	Warm/Wet	CO ₂ -baited CDC light traps	RT-PCR	.	.	771	18
25	(Mbanzulu et al., 2017)	5	29	DRC	CA	Rural (one semi-urban area site, but predominantly it was rural)	2014	18	Cool/Wet	Unbaited BG-sentinel traps and aspirators	RT-PCR	29	5	.	.
26	(Ndiaye et al., 2018)	1	184	Senegal	WA	Rural	2012-2013	60	Warm/Dry	Animal + light-baited traps, mosquito net-baited traps, CDC and CO ₂ -baited light traps	Indirect immunofluorescence using in-house hyper-immune mouse ascites fluids (after inoculating on Vero cells)	184	1	1854	.

No	Reference	Total no. of positive pools	Total no. tested	Country	Study region	Geographical region	Year of mosquito collection	No. of days of capture	Season (Wet/Dry)	Collection method	Virus screening method	Mosquito pools tested	Mosquito pools testing positive	No. of individual mosquitoes tested	No. of Individual mosquitoes testing positive
27	(Nsengimana et al., 2025)	6	323	Rwanda	EA	Rural	2021-2022	93	All seasons	Unbaited CDC light traps, BG-sentinel traps baited with both BG lure and CO ₂	Cell culture and RT-PCR	323	6	5957	.
28	(Ratovonjato et al., 2011)	8	319	Madagascar	EA	Both Urban and Rural	2008,2009	6	Warm/Wet	Net animal-baited traps, CDC light traps (with or without CO ₂)	Cell culture and RT-PCR	319	8	12785	.
29	(Sang et al., 2010)	77	3003	Kenya	EA	Rural	2006-2007	77	Warm/Wet	CO ₂ -baited CDC light traps	Cell culture and RT-PCR	3003	77	164626	.
30	(Seufi and Galal, 2010)	76	987	Sudan	NA	Not Specified	2007	Not Mentioned	Warm/Dry	CO ₂ -baited light traps and aspirators	PCR	.	.	978	76
31	(Shoemaker et al., 2019)	3	298	Uganda	EA	Rural	2016	3	Cool/Wet	CO ₂ -baited CDC light traps	Cell culture and PCR	298	3	.	.
32	(Sow et al., 2016)	1	437	Senegal	WA	Rural	2013	1	Warm/Dry	Animal-baited CDC and aspirators	RT-PCR	437	1	.	.
33	(Stoek et al., 2022)	1	779	Mauritania	WA	Rural	2018	8	Warm/Wet	Heavy Duty EVS Trap	RT-PCR	779	1	.	.
34	(Tantely et al., 2024)	37	512	Madagascar	EA	Rural	2021	6	Cool/Dry	Human-Orodr-baited BG-sentinel traps, light traps, Muirhead-Thomson pit trap	Real-time RT-PCR	512	37	2806	.

No	Reference	Total no. of positive pools	Total no. tested	Country	Study region	Geographical region	Year of mosquito collection	No. of days of capture	Season (Wet/Dry)	Collection method	Virus screening method	Mosquito pools tested	Mosquito pools testing positive	No. of individual mosquitoes tested	No. of Individual mosquitoes testing positive
35	(Van den Bergh et al., 2022)	139	4077	South Africa	SA	Rural	2017, 2018	18	Wet/Dry	CO ₂ -baited tent traps	Real-time RT-PCR	105	1	4077	139
CHIV															
36	(Bisimwa et al., 2016)	6	24	Tanzania	EA	Urban	2015	31	Warm/Wet	Mosquito Magnet baited with CO ₂	RT-PCR	24	6	1830	.
37	(Caron et al., 2012)	15	52	Gabon	CA	Urban	2010	3	Warm/Wet	Human landing collection	qRT-PCR	52	15	661	.
38	(Diallo et al., 2012)	42	4211	Senegal	WA	Rural	2009	39	Warm/Wet	Human landing collection	Real-time PCR	4211	42	39799	.
39	(Hien et al., 2022)	6	27	Burkina Faso	WA	Urban-Peri Urban	2016	30	Warm/Wet	CO ₂ -baited CDC light traps and landing collection methods	Real-time qRT-PCR	27	6	480	.
40	(Lutomiah et al., 2021)	5	524	Kenya	EA	Urban and Rural	2018	10	Warm/Wet	CDC light and BG-sentinel traps	RT-PCR	524	5	6899	.
41	(Pagès et al., 2009)	33	1126	Gabon	CA	Urban	2007	15	Cool/Dry	BG-sentinel odor traps	RT-PCR and cell culture	.	.	1126	33
42	(Patrick et al., 2018)	3	34	Tanzania	EA	Rural	2015	90	All seasons	CO ₂ -baited CDC light traps	RT-PCR	34	3	.	.
43	(Selhorst et al., 2020)	14	32	Democratic Republic of Congo	CA	Urban	2019	3	Warm/Dry	Prokopack aspirators	RT-qPCR	32	14	.	.
44	(Sow et al., 2018)	42	4211	Senegal	WA	Rural	2009-2010	28	Warm/Wet	Human landing collections	RT-PCR	4211	42	39799	.
45	(De Wegghelei	6	11	Congo	CA	Urban	2019	7	Dry	BG-sentinel traps and aspirators	RT-qPCR	11	6	.	.

No	Reference	Total no. of positive pools	Total no. tested	Country	Study region	Geographical region	Year of mosquito collection	No. of days of capture	Season (Wet/Dry)	Collection method	Virus screening method	Mosquito pools tested	Mosquito pools testing positive	No. of individual mosquitoes tested	No. of Individual mosquitoes testing positive
	re et al., 2021)														

Abbreviations: CA, Central Africa; EA, Eastern Africa; NA, Northern Africa; SA, Southern Africa; WA, Western Africa.

Supplementary Table S5. Forest plot for WNV prevalence.

Asaid et al. (2020)	0.0068	[0.0002; 0.0376]	NAFR	
Benbetka et al. (2018)	0.0303	[0.0008; 0.1576]	NAFR	
Diallo et al1. (2005)	0.0580	[0.0395; 0.0818]	WAFR	
Diallo et al2. (2018)	0.0053	[0.0017; 0.0123]	WAFR	
Faulde et al. (2012)	0.0681	[0.0635; 0.0728]	NAFR	
Guggemos et al. (2021)	0.0020	[0.0002; 0.0071]	SAFR	
LaBaud et al. (2011)	0.1810	[0.1126; 0.2681]	EAFR	
MacIntyre et al. (2023)	0.0109	[0.0062; 0.0176]	SAFR	
Mohamed et al. (2020)	0.5882	[0.3292; 0.8156]	NAFR	
Monasitri et al. (2018)	0.1600	[0.0454; 0.3608]	NAFR	
Mosser et al. (2017)	0.0016	[0.0000; 0.0090]	EAFR	
Ndiaye et al. (2018)	0.0234	[0.0160; 0.0331]	WAFR	
Ndiaye et al. (2022)	0.0032	[0.0023; 0.0043]	WAFR	
Ochieng et al. (2013)	0.0003	[0.0001; 0.0007]	EAFR	
Orba et al. (2017)	0.0149	[0.0004; 0.0804]	SAFR	
Solima et al. (2010)	0.0030	[0.0017; 0.0049]	NAFR	
Crabtree et al. (2009)	0.0004	[0.0000; 0.0021]	EAFR	
Turell et al. (2002)	0.0008	[0.0006; 0.0012]	NAFR	
Wasfi et al. (2016)	0.3333	[0.1459; 0.5697]	NAFR	
Number of studies: k = 19				
Number of observations: o = 90486				
Number of events: e = 1009				
proportion 95%-CI				
Random effects model	0.0118	[0.0040; 0.0343]		
Prediction interval		[0.0001; 0.6554]		
Quantifying heterogeneity (with 95%-CIs):				
tau ² = 5.5217; tau = 2.3498; I ² = 98.7% [98.5%; 98.9%]; H = 8.87 [8.10; 9.64]				
Test of heterogeneity:				
	Q	d.f.	p-value	
Wald	1416.66	18	< 0.0001	
LRT	2956.13	18	0	
Results for subgroups (random effects model):				
	k	proportion	95%-CI	tau ² tau Q I ²
StudyRegion = NAFR	8	0.0337	[0.0060; 0.1673]	5.9983 2.4491 782.69 99.1%
StudyRegion = WAFR	4	0.0123	[0.0038; 0.0390]	1.3875 1.1779 165.44 98.2%
StudyRegion = SAFR	3	0.0061	[0.0022; 0.0167]	0.4172 0.6459 5.51 63.7%
StudyRegion = EAFR	4	0.0022	[0.0001; 0.0362]	7.7638 2.7864 193.41 98.4%
Test for subgroup differences (random effects model):				
	Q	d.f.	p-value	
Between groups	4.05	3	0.2565	
Details of meta-analysis methods:				
- Random intercept logistic regression model				
- Maximum-likelihood estimator for tau ²				
- Calculation of I ² based on Q				
- Prediction interval based on t-distribution (df = 18)				
- Logit transformation				
- Clopper-Pearson confidence interval for individual studies				

Supplementary Table S6. Forest plot for CHIV prevalence.

	proportion	95%-CI	StudyRegion			
Bimiswa et al. (2016)	0.2500	[0.0977; 0.4671]	EAFR			
Caron et al. (2010)	0.2885	[0.1713; 0.4308]	CAFR			
Diallo et al. (2012)	0.0100	[0.0072; 0.0135]	WAFR			
Hein et al. (2022)	0.2222	[0.0862; 0.4226]	WAFR			
Lutomiah et al. (2021)	0.0095	[0.0031; 0.0221]	EAFR			
Pages et al. (2009)	0.0293	[0.0203; 0.0409]	CAFR			
Patrick et al. (2018)	0.0882	[0.0186; 0.2368]	EAFR			
Selhorst et al. (2020)	0.4375	[0.2636; 0.6234]	CAFR			
Sow et al. (2009)	0.0100	[0.0072; 0.0135]	WAFR			
Weggheleire et al. (2021)	0.5455	[0.2338; 0.8325]	CAFR			
Number of studies: k = 10						
Number of observations: o = 10252						
Number of events: e = 172						
	proportion	95%-CI				
Random effects model	0.0849	[0.0292; 0.2226]				
Prediction interval		[0.0014; 0.8617]				
Quantifying heterogeneity (with 95%-CIs):						
tau ² = 3.1268; tau = 1.7683; I ² = 97.4% [96.5%; 98.1%]; H = 6.25 [5.32; 7.18]						
Test of heterogeneity:						
	Q	d.f.	p-value			
Wald	351.45	9	< 0.0001			
LRT	254.15	9	< 0.0001			
Results for subgroups (random effects model):						
	k	proportion	95%-CI	tau ²	tau	Q I ²
StudyRegion = EAFR	3	0.0571	[0.0107; 0.2531]	2.0299	1.4247	30.42 93.4%
StudyRegion = CAFR	4	0.2332	[0.0672; 0.5620]	1.9960	1.4128	116.82 97.4%
StudyRegion = WAFR	3	0.0272	[0.0050; 0.1339]	2.1767	1.4754	49.44 96.0%
Test for subgroup differences (random effects model):						
	Q	d.f.	p-value			
Between groups	4.74	2	0.0936			
Details of meta-analysis methods:						
- Random intercept logistic regression model						
- Maximum-likelihood estimator for tau ²						
- Calculation of I ² based on Q						
- Prediction interval based on t-distribution (df = 9)						
- Logit transformation						
- Clopper-Pearson confidence interval for individual studies						

Supplementary Table S7. Forest plot for RVFV prevalence.

	proportion	95%-CI	StudyRegion				
Diallo et al	0.1107	[0.0861; 0.1394]	WAFR				
Faye et al	0.0015	[0.0004; 0.0037]	WAFR				
Hanafi et al	0.0101	[0.0021; 0.0292]	NAFR				
Le Baud et al	0.2190	[0.1442; 0.3103]	EAFR				
Lutomiah et al	0.0233	[0.0139; 0.0366]	EAFR				
Mbazulu et al	0.1724	[0.0585; 0.3577]	CAFR				
Ndiaye et al	0.0054	[0.0001; 0.0299]	WAFR				
Nsengimana et al	0.0186	[0.0068; 0.0400]	EAFR				
Ratovonjato et al	0.0251	[0.0109; 0.0488]	EAFR				
Sang et al	0.0256	[0.0203; 0.0319]	EAFR				
Seufi and Galal	0.0770	[0.0611; 0.0954]	NAFR				
Shoemaker et al	0.0101	[0.0021; 0.0291]	EAFR				
Sow et al	0.0023	[0.0001; 0.0127]	WAFR				
Stock et al	0.0013	[0.0000; 0.0071]	WAFR				
Tantely et al	0.0723	[0.0514; 0.0982]	EAFR				
van den Bergh	0.0341	[0.0287; 0.0401]	SAFR				
Number of studies: k = 16							
Number of observations: o = 15426							
Number of events: e = 465							
	proportion	95%-CI					
Random effects model	0.0210	[0.0096; 0.0452]					
Prediction interval		[0.0007; 0.3916]					
Quantifying heterogeneity (with 95%-CIs):							
tau ² = 2.3854; tau = 1.5445; I ² = 94.9% [93.0%; 96.2%]; H = 4.41 [3.78; 5.15]							
Test of heterogeneity:							
	Q	d.f.	p-value				
wald	291.59	15	< 0.0001				
LRT	434.78	15	< 0.0001				
Results for subgroups (random effects model):							
	k	proportion	95%-CI	tau ²	tau	Q	I ²
StudyRegion = WAFR	5	0.0044	[0.0007; 0.0257]	3.4173	1.8486	111.65	96.4%
StudyRegion = NAFR	2	0.0305	[0.0069; 0.1256]	1.0294	1.0146	12.58	92.0%
StudyRegion = EAFR	7	0.0344	[0.0164; 0.0710]	0.9566	0.9780	111.40	94.6%
StudyRegion = CAFR	1	0.1724	[0.0736; 0.3532]	--	--	0.00	--
StudyRegion = SAFR	1	0.0341	[0.0289; 0.0401]	--	--	0.00	--
Test for subgroup differences (random effects model):							
	Q	d.f.	p-value				
Between groups	18.11	4	0.0012				
Details of meta-analysis methods:							
- Random intercept logistic regression model							
- Maximum-likelihood estimator for tau ²							
- Calculation of I ² based on Q							
- Prediction interval based on t-distribution (df = 15)							
- Logit transformation							
- Clopper-Pearson confidence interval for individual studies							

Supplementary Table S8. Meta-regression model summaries for WNV.

Model	Focus	AIC	Significant Predictors
Model 1	GeogRegion	100.83	CLT, CLT+BSTB, CLTC+A, HDET, TP, SeasonW, SeasonWD
Model 2	CollectionMethod	100.83	CLT, CLT+BSTB, CLTC+A, HDET, TP, SeasonW, SeasonWD
Model 3	DaysOfCollection	99.98	CLT+BSTB, HDET, SeasonW, SeasonWD
Model 4	StudyRegion	97.61	SAFR, WAFR, CLT+CLTC, SeasonWD
Model 5	Season + Collection + Region	97.61	SeasonW, SeasonWD, CLT+BSTB, TP, HDET, NAFR
Model 6	ScreeningMethod	101.22	qRTPCR, CLT+CLTC, BST+A, EAFR, NAFR

Supplementary Table S9. Meta-regression plots for WNV by predictors such as screening method, trap type, season, and study region.

Mixed-Effects Model (k = 19; tau ² estimator: ML)									
logLik	deviance	AIC	BIC	AICC					
-39.5045	6.2848	107.0089	120.2311	212.0089					
tau ² (estimated amount of residual heterogeneity):				0.5953					
tau (square root of estimated tau ² value):				0.7715					
I ² (residual heterogeneity / unaccounted variability):				83.96%					
H ² (unaccounted variability / sampling variability):				6.23					
Tests for Residual Heterogeneity:									
wld(df = 6) = 99.8416, p-val < .0001									
LRT(df = 6) = 117.7977, p-val < .0001									
Test of Moderators (coefficients 2:13):									
QM(df = 12) = 104.8177, p-val < .0001									
Model Results:									
			estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt			-4.9590	1.3305	-3.7273	0.0002	-7.5667	-2.3513	***
ScreeningMethodII			5.6802	0.9947	5.7106	<.0001	3.7307	7.6298	***
ScreeningMethodqRTPCR			3.5980	0.7262	4.9549	<.0001	2.1748	5.0212	***
ScreeningMethodRTPCR			1.7461	0.9031	1.9336	0.0532	-0.0238	3.5161	.
CollectionMethodA, CLTC			-6.1057	1.3775	-4.4325	<.0001	-8.8055	-3.4059	***
CollectionMethodABT, MN, CLTC			-4.4656	1.5431	-2.8939	0.0038	-7.4899	-1.4412	**
CollectionMethodCLT			-1.5629	1.1290	-1.3843	0.1663	-3.7757	0.6500	
CollectionMethodCLTC			-4.8590	1.2288	-3.9541	<.0001	-7.2675	-2.4505	***
CollectionMethodCLTC, BST			0.5957	1.8580	0.3206	0.7485	-3.0458	4.2372	
CollectionMethodCLTC, BSTB			-3.1541	1.6252	-1.9408	0.0523	-6.3394	0.0312	.
CollectionMethodCLTC, BSTB, MN			-1.3152	1.4736	-0.8925	0.3721	-4.2034	1.5730	
CollectionMethodCLTC, CGT			-3.3873	1.7810	-1.9020	0.0572	-6.8780	0.1033	.
StudyRegionNAFR			3.5722	0.8140	4.3882	<.0001	1.9767	5.1677	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1									

Supplementary Table S10. Meta-regression model summaries for RVFV.

Model	Focus	AIC	Significant Predictors
Model 1	GeogRegion	100.83	CLT, CLT+BSTB, CLTC+A, HDET, TP, SeasonW, SeasonWD
Model 2	CollectionMethod	100.83	CLT, CLT+BSTB, CLTC+A, HDET, TP, SeasonW, SeasonWD
Model 3	DaysOfCollection	99.98	CLT+BSTB, HDET, SeasonW, SeasonWD
Model 4	StudyRegion	97.61	SAFR, WAFR, CLT+CLTC, SeasonWD
Model 5	Season + Collection + Region	97.61	SeasonW, SeasonWD, CLT+BSTB, TP, HDET, NAFR
Model 6	ScreeningMethod	101.22	qRTPCR, CLT+CLTC, BST+A, EAFR, NAFR

Supplementary Table S11. Meta-regression plots for RVFV by predictors such as season, collection method, and study region.

Mixed-Effects Model (k = 16; tau ² estimator: ML)									
logLik	deviance	AIC	BIC	AICC					
-34.8042	3.8658	97.6083	108.4245	517.6083					
tau ² (estimated amount of residual heterogeneity):				0					
tau (square root of estimated tau ² value):				0					
I ² (residual heterogeneity / unaccounted variability):				0.00%					
H ² (unaccounted variability / sampling variability):				1.00					
Tests for Residual Heterogeneity:									
Wld(df = 3) = 3.0093, p-val = 0.3902									
LRT(df = 3) = 3.8658, p-val = 0.2763									
Test of Moderators (coefficients 2:13):									
QM(df = 12) = 291.8543, p-val < .0001									
Model Results:									
			estimate	se	zval	pval	ci.lb	ci.ub	
intrcpt			-5.7350	0.7082	-8.0974	<.0001	-7.1231	-4.3468	***
SeasonW			2.8239	0.5107	5.5294	<.0001	1.8230	3.8249	***
SeasonWD			-1.4147	0.4460	-3.1718	0.0015	-2.2890	-0.5405	**
CollectionMethodBST, A			1.3424	1.0021	1.3397	0.1804	-0.6216	3.3064	
CollectionMethodCLT			1.6398	0.9045	1.8129	0.0698	-0.1330	3.4126	.
CollectionMethodCLT, BSTB			3.1826	0.7285	4.3685	<.0001	1.7547	4.6104	***
CollectionMethodCLT, CLTC			0.8276	0.8833	0.9369	0.3488	-0.9037	2.5589	
CollectionMethodCLTC			-0.7915	0.8672	-0.9128	0.3614	-2.4912	0.9081	
CollectionMethodCLTC, A			1.3096	1.0502	1.2470	0.2124	-0.7488	3.3680	
CollectionMethodHDET			-3.7457	1.3280	-2.8205	0.0048	-6.3486	-1.1428	**
CollectionMethodNM, ABT, CLT, CLTC			-0.7493	0.9437	-0.7940	0.4272	-2.5990	1.1004	
CollectionMethodTP			2.3910	0.7135	3.3512	0.0008	0.9926	3.7894	***
StudyRegionNAFR			1.9415	0.7662	2.5339	0.0113	0.4398	3.4433	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1									

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