

Annex 14A. Estimates of Parasitemia and Clinical Disease among School-Aged Children in Africa

Supplemental material for: Brooker, S.J., S. Clarke, D. Fernando, C.W. Gitonga, J. Nankabirwa, and others. 2017. "Malaria in Middle Childhood and Adolescence." In *Disease Control Priorities* (third edition), Volume 8, *Child and Adolescent Health and Development*, edited by D.A.P Bundy, N. de Silva, S. Horton, D.T. Jamison, and G.C Patton. Washington DC: World Bank.

Table 14A.1 Studies on the Prevalence of Malaria Parasitemia among Schoolchildren, 1998-2013

Country	Transmission setting	Age range (years)	Diagnostic method	Survey transmission season	Year of survey	Estimated prevalence (percent)	Source
East Africa			Microscopy	Not specified			
<i>Uganda</i>	High	8–14	Microscopy	Not specified	2008	51	Nankabirwa and others 2010
	High	5–9	Microscopy	High transmission	2008	64	Pullan and others 2010
	Moderate	10–12	Microscopy	Not specified	2009–10	46	Kabatereine and others 2011
	High	6–14	Microscopy	Not specified	2011	30	Nankabirwa and others 2013
	High	6–15			2012	56.5	Uganda Malaria Surveillance Project (unpublished)
	Moderate	6–15			2012	16	Uganda Malaria Surveillance Project (unpublished)
	Low	6–15			2012	14	Uganda Malaria Surveillance Project (unpublished)
<i>Kenya</i>	High	8–14	Microscopy	High transmission	2002	23	Clarke and others 2004
	Epidemic prone	8–14	Microscopy	High transmission	2002	47 ^a	Clarke and others 2004

	High	5–18	Microscopy	High transmission	2005–06	41	Clarke and others 2008
	High	5–18	Microscopy	High transmission	2008–10	18	Gitonga and others 2012
	Seasonal	5–18	Microscopy	High transmission	2008–10	2	Gitonga and others 2012
	Moderate	5–18	Microscopy	High transmission	2008–10	3	Gitonga and others 2012
	Low	5–18	Microscopy	High transmission	2008–10	< 1	Gitonga and others 2012
<i>Tanzania</i>	High	Mean 7.96	Microscopy		2005	35	Mboera and others 2011
	High	0.5–14	RDT (Paracheck Pf and CareStart™)	High transmission	2011	9–23	West and others 2013
West Africa							
<i>Senegal</i>	Seasonal	≤ 9	Microscopy	High	2004–05	9	Dia and others 2008
	Seasonal	6–14	Microscopy	Average of high and low transmission	2004–06	0.9	Ouldabdallahi and others 2011
	Moderate-high seasonal	7–14	Microscopy	High transmission	2011	54	Clarke and others 2012
<i>The Gambia</i>	Seasonal	6–12	Microscopy	High transmission	2008–09	17	Oduro and others 2013
	Seasonal	4–21	PCR	Low transmission	2011	14	Takem and others 2013
<i>Côte d'Ivoire</i>	High	5–9	Microscopy	Annual average	1998–99	66	Assi and others 2013
	High	6–10	Microscopy	Not specified	2001–02	67	Raso and others 2005
	High	6–14	Microscopy	Across transmission seasons	2006–07	58	Rohner and others 2010
<i>Mali</i>	High, seasonal	6–14	Microscopy	Annual average	2007–08	42	Thuilliez and others 2010
	High, seasonal	7–14	Microscopy	High transmission	2011	83	Clarke and others 2012
<i>Nigeria</i>	High	8–16	Microscopy	High transmission	2007–08	26	Ojurongbe and others 2011
Central Africa							

<i>Cameroon</i>	High	2–11			2002	30	Nkuo Akanji, Ajame, and Achidi 2002
	High	4–16	Microscopy	Not specified	2006	40	Wanji and others 2008
	High	4–12			2007	59	Achidi and others 2008
	High	4–15	Microscopy	High transmission	2009	34	Kimbi, Nformi, and Ndamukong 2013
<i>Congo, Rep.</i>	High	1–9	Microscopy		2010	16	Ibara-Okabande and others 2012
<i>Equatorial Guinea</i>	High	5–9	RDT	Not specified	2009–10	40	Rehman and others 2011
	High	10–14	RDT	Not specified	2009–10	42	Rehman and others 2011
Other parts of Africa							
<i>Ethiopia</i>	Low	5–16	Microscopy	High transmission	2009	0–15	Ashton and others 2011
<i>Somalia</i>	Low	5–14	RDT	Not specified	2007	20.5	Noor and others 2008
<i>Mozambique</i>	High	5–7	Microscopy	High transmission	2002–03	48.1	Mabunda and others 2008
<i>Malawi</i>	High	5–9	RDT	Not specified	2009–10	53	Rehman and others 2011
	High	10–14	RDT	Not specified	2009–10	52	Rehman and others 2011
	High	5–21	Microscopy	High transmission	2011	60	Mathanga and others 2015
	High	6–15	PCR	High transmission	2013	31	Walldorf and others 2015

Note: Recorded during an outbreak

Table 14A.2 Recent Studies Reporting the Incidence of Malaria in School-Age Children in Africa

Location	Transmission setting	Year	Method	Follow-up period	Sample size	Age range (years)	Observed incidence	Calculated annual incidence Episodes/child/year ^a	Source
Year-round transmission									
<i>Uganda</i>	High perennial	2011	Active case detection through daily roll call ^b	12 months	740	6–14	83 episodes/242.7 child-years at risk	0.34	Nankabirwa and others 2014
<i>Kenya</i>	High perennial	2002	Active case detection by visiting children 2 to 3 times per week	11 weeks	276	8–14	0.005/child-weeks at risk	0.26	Clarke and others 2004
<i>Kenya</i>	Epidemic prone	2002	Active case detection by visiting children 2 to 3 times per week	11 weeks	330	8–14	0.029/child-weeks at risk	0.49 during an epidemic outbreak	Clarke and others 2004
<i>Ghana</i>	Moderate	2002	Active case detection through weekly visits	9 months	352	6–10	0.22–0.25/child/year	0.22–0.25	Dodoo and others 2008
Highly-seasonal transmission									
<i>Burkina Faso</i>	High, seasonal	2003	Active case detection through daily visits	4 months	51	6–8	2.7/child-year at risk	2.7	Nebie and others 2008
					65	8–11	0.59/child-year at risk	0.59	Nebie and others 2008
					65	11–15	0.37/child-year at risk	0.37	Nebie and others 2008
<i>Mali</i>	High, Seasonal	2007–08	Active case detection through monthly visits ^b	8 months	98	6–13	1.46/child-year at risk	1.46	Barger and others 2009

<i>The Gambia</i>	Seasonal	2008–09	Active case detection through weekly visits	22 weeks	439	6–15	0.004/child-weeks at risk	0.025	Ceesay and others 2010
Other									
<i>Ethiopia</i>	Low	2009–11	Active case detection through weekly visits and passive detection of cases between weekly visits	101 weeks	2,075	5–14	110/2,075 for 101 weeks	0.03	Loha and Lindtjørn 2012

Notes:

- ^a Calculation of the annual incidence assumes uniform incidence throughout the year for areas of perennial transmission; in areas of highly seasonal transmission where transmission is limited to a few months each year, total annual incidence is assumed to equate to that measured during the period of observation.
- ^b When data were collected during an intervention trial, incidence data refer to observations in the control arm.

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