



Drug efficacy against *P. falciparum*

Summary of treatment failure rates among patients infected with *P. falciparum*, grouped by country and treatment

Country	Drug	Follow-up	Study years	No. of studies	median	min	max	percentile 25th	75th
Afghanistan	Artemether-lumefantrine	28 days	2011 - 2019	7	0.0	0.0	0.0	0.0	0.0
	Artesunate+sulfadoxine-pyrimethamine	28 days	2010 - 2016	4	0.0	0.0	1.0	0.0	0.3
Angola	Artemether-lumefantrine	28 days	2013 - 2019	9	4.5	1.1	13.6	2.7	11.7
	Artesunate-amodiaquine	28 days	2015 - 2019	7	0.0	0.0	6.3	0.0	2.5
	Dihydroartemisinin-piperaquine	42 days	2015 - 2017	4	0.0	0.0	1.4	0.0	0.4
Bangladesh	Artemether-lumefantrine	28 days	2010 - 2019	19	0.0	0.0	14.3	0.0	0.0
Benin	Artemether-lumefantrine	28 days	2011 - 2017	6	0.7	0.0	3.5	0.0	1.7
Bhutan	Artemether-lumefantrine	28 days	2010 - 2013	4	0.0	0.0	0.0	0.0	0.0
Brazil	Artemether-lumefantrine	28 days	2015 - 2016	1	0.0	0.0	0.0	0.0	0.0
	Artesunate-mefloquine	42 days	2010 - 2017	6	0.0	0.0	0.0	0.0	0.0
Burkina Faso	Artemether-lumefantrine	28 days	2011 - 2016	2	1.8	1.5	2.1	1.7	2.0
	Artesunate-amodiaquine	28 days	2011 - 2016	4	3.2	1.0	4.4	2.7	3.5
	Artesunate-pyronaridine	42 days	2011 - 2016	2	0.9	0.6	1.2	0.8	1.1
	Dihydroartemisinin-piperaquine	42 days	2011 - 2016	2	0.0	0.0	0.0	0.0	0.0
Burundi	Artesunate-amodiaquine	28 days	2015 - 2019	5	7.3	2.8	7.7	6.8	7.7
Cambodia	Artemether-lumefantrine	28 days	2010 - 2011	1	5.0	5.0	5.0	5.0	5.0
	Atovaquone-proguanil	28 days	2014 - 2015	2	0.8	0.0	1.5	0.4	1.1
	Artesunate+atovaquone-proguanil	28 days	2014 - 2015	2	0.0	0.0	0.0	0.0	0.0
	Artesunate-amodiaquine	28 days	2016 - 2017	2	18.2	13.8	22.6	16.0	20.4
	Artesunate-mefloquine	42 days	2010 - 2019	29	0.0	0.0	12.5	0.0	0.0
	Artesunate-pyronaridine	42 days	2014 - 2019	9	1.7	0.0	18.0	0.0	3.3
	Dihydroartemisinin-piperaquine	42 days	2010 - 2018	30	14.6	0.0	85.7	4.2	33.5
Cameroon	Artemether-lumefantrine	28 days	2010 - 2013	2	3.3	3.2	3.4	3.3	3.4
	Amodiaquine+sulfadoxine-pyrimethamine	28 days	2014 - 2014	1	8.6	8.6	8.6	8.6	8.6
	Artesunate-amodiaquine	28 days	2010 - 2014	5	4.1	1.9	8.2	1.9	6.5
	Dihydroartemisinin-piperaquine	42 days	2010 - 2013	2	3.5	3.1	3.8	3.3	3.6

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Central African Republic	Artemether-lumefantrine	28 days	2010 - 2017	2	1.1	0.0	2.2	0.6	1.7
	Amodiaquine+sulfadoxine-pyrimethamine	28 days	2010 - 2010	1	3.6	3.6	3.6	3.6	3.6
	Artesunate-amodiaquine	28 days	2010 - 2010	1	0.0	0.0	0.0	0.0	0.0
Chad	Artemether-lumefantrine	28 days	2019 - 2020	2	0.0	0.0	0.0	0.0	0.0
	Artesunate-amodiaquine	28 days	2011 - 2020	4	0.0	0.0	1.8	0.0	0.5
China	Artesunate	28 days	2011 - 2011	1	0.0	0.0	0.0	0.0	0.0
	Dihydroartemisinin-piperaquine	42 days	2012 - 2015	8	0.0	0.0	3.2	0.0	0.0
Colombia	Artemether-lumefantrine	28 days	2011 - 2019	5	0.0	0.0	0.0	0.0	0.0
Comoros	Artemether-lumefantrine	28 days	2011 - 2017	13	0.0	0.0	2.5	0.0	0.0
Congo	Artemether-lumefantrine	28 days	2010 - 2019	6	0.0	0.0	3.6	0.0	1.4
	Artesunate-amodiaquine	28 days	2010 - 2017	4	2.4	0.0	4.0	1.6	3.0
Côte d'Ivoire	Artemether-lumefantrine	28 days	2012 - 2019	23	0.0	0.0	5.8	0.0	1.5
	Artesunate-amodiaquine	28 days	2012 - 2019	18	0.0	0.0	2.1	0.0	0.0
Democratic Republic of the Congo	Artemether-lumefantrine	28 days	2011 - 2018	15	0.0	0.0	5.9	0.0	1.4
	Artesunate-amodiaquine	28 days	2011 - 2017	12	1.1	0.0	4.8	0.0	2.2
	Dihydroartemisinin-piperaquine	42 days	2011 - 2017	6	0.0	0.0	5.2	0.0	1.5
Equatorial Guinea	Artemether-lumefantrine	28 days	2018 - 2018	3	4.9	0.0	7.6	2.5	6.3
	Artesunate-amodiaquine	28 days	2010 - 2018	6	0.7	0.0	4.9	0.0	2.1
Eritrea	Artemether-lumefantrine	28 days	2017 - 2017	5	0.0	0.0	0.0	0.0	0.0
	Artesunate-amodiaquine	28 days	2010 - 2016	18	2.4	0.0	7.9	0.0	4.4
Ethiopia	Artemether-lumefantrine	28 days	2010 - 2018	23	1.2	0.0	8.0	0.0	2.3
	Dihydroartemisinin-piperaquine	42 days	2017 - 2018	2	0.0	0.0	0.0	0.0	0.0
Gabon	Artemether-lumefantrine	28 days	2014 - 2017	4	2.8	2.0	4.1	2.5	3.1
	Artesunate-amodiaquine	28 days	2014 - 2018	3	3.2	0.0	4.8	1.6	4.0
Gambia	Artemether-lumefantrine	28 days	2010 - 2016	13	0.0	0.0	11.9	0.0	1.6
	Dihydroartemisinin-piperaquine	42 days	2014 - 2018	2	0.0	0.0	0.0	0.0	0.0
Ghana	Artemether-lumefantrine	28 days	2010 - 2018	18	1.9	0.0	9.4	0.0	5.6
	Artesunate-amodiaquine	28 days	2010 - 2017	26	0.0	0.0	6.6	0.0	1.8
Guinea	Artemether-lumefantrine	28 days	2015 - 2019	6	2.0	0.0	7.6	1.0	6.4
	Artesunate-amodiaquine	28 days	2011 - 2019	8	1.5	0.0	7.7	0.7	3.7
	Artesunate-pyronaridine	42 days	2011 - 2016	1	0.5	0.5	0.5	0.5	0.5

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Guinea	Dihydroartemisinin-piperaquine	42 days	2011 - 2016	1	0.4	0.4	0.4	0.4	0.4
Guinea-Bissau	Artemether-lumefantrine	28 days	2012 - 2015	1	5.0	5.0	5.0	5.0	5.0
	Dihydroartemisinin-piperaquine	42 days	2012 - 2015	1	0.0	0.0	0.0	0.0	0.0
Guyana	Artesunate	28 days	2014 - 2014	1	0.0	0.0	0.0	0.0	0.0
India	Artemether-lumefantrine	28 days	2010 - 2019	31	0.0	0.0	4.0	0.0	0.6
	Artesunate+sulfadoxine-pyrimethamine	28 days	2010 - 2017	56	0.0	0.0	25.9	0.0	1.5
Indonesia	Artemether-lumefantrine	28 days	2015 - 2015	1	0.0	0.0	0.0	0.0	0.0
	Artesunate-amodiaquine	28 days	2011 - 2013	2	10.8	4.8	16.7	7.8	13.7
	Dihydroartemisinin-piperaquine	42 days	2010 - 2017	7	0.0	0.0	3.9	0.0	2.2
Iran (Islamic Republic of)	Artesunate+sulfadoxine-pyrimethamine	28 days	2010 - 2015	7	0.0	0.0	1.0	0.0	0.0
Kenya	Artemether-lumefantrine	28 days	2010 - 2017	7	2.8	0.0	9.0	1.8	3.7
	Artesunate-pyronaridine	42 days	2015 - 2016	1	5.6	5.6	5.6	5.6	5.6
	Dihydroartemisinin-piperaquine	42 days	2010 - 2017	4	2.5	0.5	6.0	1.1	4.3
Lao People's Democratic Republic	Artemether-lumefantrine	28 days	2010 - 2018	10	7.6	0.0	17.2	2.9	13.2
	Artesunate-mefloquine	42 days	2018 - 2019	1	8.3	8.3	8.3	8.3	8.3
	Artesunate-pyronaridine	42 days	2018 - 2019	1	0.0	0.0	0.0	0.0	0.0
	Dihydroartemisinin-piperaquine	42 days	2016 - 2017	1	32.4	32.4	32.4	32.4	32.4
Liberia	Artemether-lumefantrine	28 days	2017 - 2018	2	0.0	0.0	0.0	0.0	0.0
	Artesunate-amodiaquine	28 days	2010 - 2018	3	7.3	0.0	8.0	3.7	7.7
Madagascar	Artemether-lumefantrine	28 days	2018 - 2018	3	1.8	0.0	4.0	0.9	2.9
	Artesunate-amodiaquine	28 days	2012 - 2018	10	0.0	0.0	2.0	0.0	0.5
Malawi	Artemether-lumefantrine	28 days	2010 - 2017	11	2.4	0.0	19.5	1.1	4.5
	Artesunate-amodiaquine	28 days	2012 - 2017	3	1.0	1.0	2.0	1.0	1.5
	Dihydroartemisinin-piperaquine	42 days	2013 - 2015	1	0.8	0.8	0.8	0.8	0.8
Malaysia	Artemether-lumefantrine	28 days	2014 - 2018	5	0.0	0.0	0.0	0.0	0.0
	Artesunate-mefloquine	28 days	2012 - 2016	1	0.0	0.0	0.0	0.0	0.0
Mali	Artemether-lumefantrine	28 days	2010 - 2016	11	0.9	0.0	2.6	0.0	2.1
	Artesunate	28 days	2010 - 2011	1	0.0	0.0	0.0	0.0	0.0
	Artesunate+sulfadoxine-pyrimethamine	28 days	2010 - 2014	3	0.0	0.0	0.0	0.0	0.0

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Mali	Artesunate-amodiaquine	28 days	2011 - 2016	4	0.0	0.0	0.0	0.0	0.0
	Artesunate-pyronaridine	42 days	2011 - 2016	4	0.0	0.0	0.6	0.0	0.2
	Dihydroartemisinin-piperaquine	42 days	2011 - 2016	5	0.0	0.0	1.2	0.0	0.0
Mauritania	Artesunate-amodiaquine	28 days	2012 - 2012	2	1.8	1.8	1.8	1.8	1.8
Mozambique	Artemether-lumefantrine	28 days	2011 - 2018	13	1.5	0.0	5.8	0.0	3.7
	Artesunate-amodiaquine	28 days	2011 - 2018	6	0.0	0.0	1.4	0.0	0.9
	Dihydroartemisinin-piperaquine	42 days	2013 - 2015	1	0.0	0.0	0.0	0.0	0.0
Myanmar	Artemether-lumefantrine	28 days	2010 - 2018	28	1.9	0.0	6.0	0.0	2.6
	Artesunate	28 days	2011 - 2011	1	0.0	0.0	0.0	0.0	0.0
	Artesunate-mefloquine	42 days	2011 - 2013	5	0.0	0.0	2.2	0.0	1.4
	Artesunate-pyronaridine	42 days	2017 - 2018	4	0.0	0.0	0.0	0.0	0.0
	Dihydroartemisinin-piperaquine	42 days	2011 - 2018	23	0.0	0.0	4.8	0.0	0.0
Nepal	Artemether-lumefantrine	28 days	2010 - 2014	4	0.0	0.0	6.3	0.0	1.6
Niger	Artemether-lumefantrine	28 days	2011 - 2017	5	2.7	0.0	5.6	1.1	5.3
	Artesunate-amodiaquine	28 days	2011 - 2017	4	1.0	0.0	2.7	0.4	1.7
	Dihydroartemisinin-piperaquine	42 days	2013 - 2014	1	1.9	1.9	1.9	1.9	1.9
Nigeria	Artemether-lumefantrine	28 days	2010 - 2018	13	0.0	0.0	7.8	0.0	2.4
	Artesunate-amodiaquine	28 days	2010 - 2018	13	0.0	0.0	6.9	0.0	2.8
	Dihydroartemisinin-piperaquine	42 days	2014 - 2018	10	0.0	0.0	1.9	0.0	0.0
Pakistan	Artemether-lumefantrine	28 days	2012 - 2019	6	0.0	0.0	1.2	0.0	0.0
	Artesunate+sulfadoxine-pyrimethamine	28 days	2011 - 2017	6	0.0	0.0	1.5	0.0	0.8
	Dihydroartemisinin-piperaquine	42 days	2015 - 2015	2	0.0	0.0	0.0	0.0	0.0
Papua New Guinea	Artemether-lumefantrine	28 days	2011 - 2019	6	0.0	0.0	1.1	0.0	0.0
	Dihydroartemisinin-piperaquine	42 days	2012 - 2014	2	0.0	0.0	0.0	0.0	0.0
Philippines	Artemether-lumefantrine	28 days	2013 - 2018	7	0.0	0.0	9.1	0.0	2.8
Rwanda	Artemether-lumefantrine	28 days	2012 - 2018	9	3.2	0.8	5.8	2.6	4.0
	Dihydroartemisinin-piperaquine	42 days	2013 - 2015	2	2.1	0.8	3.3	1.4	2.7
Sao Tome and Principe	Artemether-lumefantrine	28 days	2017 - 2018	2	0.0	0.0	0.0	0.0	0.0
	Artesunate-amodiaquine	28 days	2017 - 2017	2	0.0	0.0	0.0	0.0	0.0

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Senegal	Artemether-lumefantrine	28 days	2010 - 2019	12	0.0	0.0	1.6	0.0	0.2
	Artesunate-amodiaquine	28 days	2010 - 2019	7	0.0	0.0	1.7	0.0	0.3
	Artesunate-mefloquine	42 days	2010 - 2010	1	1.5	1.5	1.5	1.5	1.5
	Dihydroartemisinin-piperaquine	42 days	2010 - 2018	4	0.5	0.0	2.4	0.0	1.3
Sierra Leone	Artemether-lumefantrine	28 days	2011 - 2016	4	0.0	0.0	0.0	0.0	0.0
	Artesunate-amodiaquine	28 days	2011 - 2016	4	0.0	0.0	0.0	0.0	0.0
	Dihydroartemisinin-piperaquine	42 days	2016 - 2016	2	0.0	0.0	0.0	0.0	0.0
Solomon Islands	Artemether-lumefantrine	28 days	2011 - 2017	3	5.3	0.0	6.3	2.7	5.8
Somalia	Artemether-lumefantrine	28 days	2013 - 2018	5	0.0	0.0	2.4	0.0	1.0
	Artesunate+sulfadoxine-pyrimethamine	28 days	2011 - 2015	4	8.4	1.0	22.2	3.6	14.8
	Dihydroartemisinin-piperaquine	42 days	2016 - 2016	2	1.8	1.0	2.5	1.4	2.1
Sudan	Artemether-lumefantrine	28 days	2010 - 2018	16	1.4	0.0	7.9	0.0	2.4
	Artesunate+sulfadoxine-pyrimethamine	28 days	2010 - 2016	16	4.0	0.0	18.1	1.3	7.2
	Dihydroartemisinin-piperaquine	42 days	2015 - 2017	4	0.0	0.0	1.8	0.0	0.5
Suriname	Artemether-lumefantrine	28 days	2011 - 2011	1	0.0	0.0	0.0	0.0	0.0
	Artesunate-mefloquine	28 days	2013 - 2014	1	0.0	0.0	0.0	0.0	0.0
Thailand	Artemether-lumefantrine	28 days	2012 - 2012	2	8.5	5.6	11.3	7.0	9.9
	Artesunate-mefloquine	42 days	2010 - 2016	18	7.4	0.0	49.1	0.0	18.1
	Dihydroartemisinin-piperaquine	42 days	2014 - 2018	5	5.9	0.0	100.0	0.0	86.7
Timor-Leste	Artemether-lumefantrine	28 days	2012 - 2019	2	0.0	0.0	0.0	0.0	0.0
Togo	Artemether-lumefantrine	28 days	2012 - 2013	3	2.7	0.0	3.0	1.4	2.9
	Artesunate-amodiaquine	28 days	2012 - 2013	3	0.0	0.0	3.8	0.0	1.9
Uganda	Artemether-lumefantrine	28 days	2011 - 2019	12	1.8	0.0	13.9	0.0	3.1
	Artesunate-amodiaquine	28 days	2013 - 2014	3	0.0	0.0	0.0	0.0	0.0
	Dihydroartemisinin-piperaquine	42 days	2015 - 2019	6	1.3	0.0	1.6	0.3	1.4
United Republic of Tanzania (mainland)	Artemether-lumefantrine	28 days	2010 - 2018	28	1.4	0.0	9.7	0.0	4.2
	Artesunate-amodiaquine	28 days	2011 - 2017	5	0.0	0.0	2.0	0.0	0.0
	Dihydroartemisinin-piperaquine	42 days	2014 - 2017	5	0.0	0.0	3.0	0.0	0.9
Viet Nam	Artemether-lumefantrine	28 days	2015 - 2016	1	0.0	0.0	0.0	0.0	0.0

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Viet Nam	Artesunate	28 days	2010 - 2012	3	3.1	2.6	8.2	2.9	5.7
	Artesunate-mefloquine	42 days	2019 - 2019	3	0.0	0.0	0.0	0.0	0.0
	Artesunate-pyronaridine	42 days	2017 - 2018	5	1.6	0.0	15.8	0.0	5.1
	Dihydroartemisinin-piperaquine	42 days	2010 - 2019	46	0.0	0.0	68.1	0.0	3.6
Yemen	Artemether-lumefantrine	28 days	2010 - 2020	3	0.0	0.0	0.0	0.0	0.0
	Artesunate+sulfadoxine-pyrimethamine	28 days	2010 - 2014	5	0.0	0.0	3.6	0.0	3.0
Zambia	Artemether-lumefantrine	28 days	2012 - 2016	7	0.0	0.0	0.0	0.0	0.0
	Artesunate-amodiaquine	28 days	2016 - 2016	3	0.0	0.0	0.0	0.0	0.0
	Dihydroartemisinin-piperaquine	42 days	2016 - 2016	3	0.0	0.0	0.0	0.0	0.0
Zimbabwe	Artemether-lumefantrine	28 days	2010 - 2017	20	1.5	0.0	9.1	0.0	3.5