

# Community-based strategies to increase coverage of Intermittent Preventive Treatment in Pregnancy with Sulfadoxine-Pyrimethamine in sub-Saharan Africa: A systematic review, meta-analysis, meta-ethnography, and economic assessment

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Supplementary Table 1: Search terms and number of records by database

Database	Search terms	Result
<b>PubMed</b>	pregnant women OR provider* OR ANC service* OR community health worker* OR community health volunteer* OR community health relay* OR ANC nurse OR ANC midwife OR health worker AND intermittent preventive treatment* OR intermittent presumptive therap* OR intermittent protective treatment* OR ipt OR iptp* OR sulphadoxine pyrimethamine OR sulfadoxine OR sulfadoxine-pyrimethamine AND delivery OR administration OR distribution OR uptake* OR community deliver* OR outcome* OR strategy OR utilisation OR utilization OR coverage OR barrier* OR facilitator* OR compliance OR adherence OR attitude* OR belie* OR knowledge OR delivery effectiv* OR determinant* OR evaluat* OR delivery system* OR predictor* OR DOT OR directly observed OR behaviour* OR behavior* OR promotion*	958
<b>Cochrane Library</b>	pregnant women OR provider* OR ANC service* OR community health worker* OR community health volunteer* OR community health relay* OR ANC nurse OR ANC midwife OR health worker AND intermittent preventive treatment* OR intermittent presumptive therap* OR intermittent protective treatment* OR ipt OR iptp* OR sulphadoxine pyrimethamine OR sulfadoxine OR sulfadoxine-pyrimethamine AND delivery OR administration OR distribution OR uptake* OR community deliver* OR outcome* OR strategy OR utilisation OR utilization OR coverage OR barrier* OR facilitator* OR compliance OR adherence OR attitude* OR belie* OR knowledge OR delivery effectiv* OR determinant* OR evaluat* OR delivery system* OR predictor* OR DOT OR directly observed OR behaviour* OR behavior* OR promotion*	965
<b>Malaria in Pregnancy Library</b>	pregnant women OR provider* OR ANC service* OR community health worker* OR community health volunteer* OR community health relay* OR ANC nurse OR ANC midwife OR health worker AND intermittent preventive treatment* OR intermittent presumptive therap* OR intermittent protective treatment* OR ipt OR iptp* OR sulphadoxine pyrimethamine OR sulfadoxine OR sulfadoxine-pyrimethamine AND delivery OR administration OR distribution OR uptake* OR community deliver* OR outcome* OR strategy OR utilisation OR utilization OR coverage OR barrier* OR facilitator* OR compliance OR adherence OR attitude* OR belie* OR knowledge OR delivery effectiv* OR determinant* OR evaluat* OR delivery system* OR predictor* OR DOT OR directly observed OR behaviour* OR behavior* OR promotion*	1654
<b>EBSCOhost (Medline, Global Health &amp; GH Archive)</b>	pregnant women OR provider* OR ANC service* OR community health worker* OR community health volunteer* OR community health relay* OR ANC nurse OR ANC midwife OR health worker AND intermittent preventive treatment* OR intermittent presumptive therap* OR intermittent protective treatment* OR ipt OR iptp* OR sulphadoxine pyrimethamine OR sulfadoxine OR sulfadoxine-pyrimethamine AND delivery OR administration OR distribution OR uptake* OR community deliver* OR outcome* OR strategy OR utilisation OR utilization OR coverage OR barrier* OR facilitator* OR compliance OR adherence OR attitude* OR belie* OR knowledge OR delivery effectiv* OR determinant* OR evaluat* OR delivery system* OR predictor* OR DOT OR directly observed OR behaviour* OR behavior* OR promotion*	1155
<b>International Clinical Trials Registry Platform</b>	(pregnant women OR provider* OR ANC service* OR community health worker* OR community health volunteer* OR community health relay* OR ANC nurse OR ANC midwife OR health worker) AND (intermittent preventive treatment* OR intermittent presumptive therap* OR intermittent protective treatment* OR ipt OR iptp* OR sulphadoxine pyrimethamine OR sulfadoxine OR sulfadoxine-pyrimethamine) AND (delivery OR administration OR distribution OR uptake* OR community deliver* OR outcome* OR strategy OR utilisation OR utilization OR coverage OR barrier* OR facilitator* OR compliance OR adherence OR attitude* OR belie* OR knowledge OR delivery effectiv* OR determinant* OR evaluat* OR delivery system* OR predictor* OR DOT OR directly observed OR behaviour* OR behavior* OR promotion*)	21

## Supplementary methods

### Data extraction

#### Assignment of study quality in categories

Each study was graded numerically by assigning a grade of 1 to 3 to each of the bias domains, with 1 being high or serious risk of bias, 2 being some concerns or moderate risk of bias, and 3 being low risk of bias. An overall score was tabulated for each study by dividing the sum of the grades from each domain by the number of domains. A study with a score under 1.5 was considered of poor quality, a study with a score between 1.6 and 2.4 of moderate quality, while a study with a score of 2.5 to 3 was considered of good quality.

We intended to combine summary estimates using meta-analysis, taking clustering into account, and using a random effects model, and to present results in forest plots. However, effect measures reported were diverse, and only four studies presented effect measures that could directly be combined (Difference-in-Differences results) using meta-analysis. Some studies were cluster-adjusted but data were not presented adjusted for clusters and others were not cluster adjusted but clusters such as villages and health centres were described. To adjust the studies for clustering using the design effects, we estimated the average number of participants per cluster to our best ability with information available from the articles (Supplementary table 2).

Supplementary Table 2. Estimates of average number of participants per cluster for each (sub) study

Study	Country	Cluster number	Total sample	Average cluster size
Gutman 2020 <sup>1</sup>	Burkina Faso	12 health facilities	360	30
Rubenstein 2022 <sup>2</sup>	Malawi	20 health facilities	687	34.4
Cosmic 2018 <sup>3</sup>	Benin	30 villages	971	32.4
Cosmic 2018 <sup>3</sup>	Burkina Faso	30 villages	1762	60
Cosmic 2018 <sup>3</sup>	Gambia	30 villages	1960	65.3
Gonzalez 2023 <sup>4*</sup>	DRC	NR	NR	13
Gonzalez 2023 <sup>4*</sup>	Madagascar	NR	NR	13
Gonzalez 2023 <sup>4*</sup>	Mozambique	NR	NR	13
Gonzalez 2023 <sup>4*</sup>	Nigeria	NR	NR	13
Gies 2009 <sup>5</sup>	Burkina Faso	12 health facilities	2766	230.5
Okeibunor 2011 <sup>6</sup>	Nigeria	6 LGAs	1378	35.5
Wangalwa 2012 <sup>7†</sup>	Kenya	14 supervision strata	266	19
Msyamboza 2009 <sup>8</sup>	Malawi	26 villages	1809	69.6
Ndyomugyenyi 2009 <sup>9†</sup>	Uganda	79 villages	926	11.7
Mbonye 2007 <sup>10</sup>	Uganda	25 parishes	2785	111.4
Orobaton 2016 <sup>11†</sup>	Nigeria	42 wards	31493	749.8
Kayentao 2023 <sup>12‡</sup>	Mali	137 villages	5,112	37.3

LGA, local government area level. NR, not reported.

\*Gonzalez et al (2023) reported that an average of 13 women per cluster were enrolled.<sup>4</sup>

†These studies did not report a cluster design. However, the description of the study made it likely that a cluster adjustment was warranted.

‡Reported cluster adjusted risk ratio. No design effect calculation was needed.

As an additional measure of heterogeneity, we used the prediction interval, which allows to quantify the extent of dispersion, or the range of effects, whereas the 95% confidence interval of the effect estimate is an indicator of precision. Note that all the measures of heterogeneity, such as  $I^2$  and the prediction interval are not reliable when based on a small number of studies (< 10).

The WHO suggested that “Where inequities in ANC service and reach exist, other delivery methods (such as the use of community health workers) may be explored, ensuring that ANC attendance is maintained and underlying inequities in ANC delivery are addressed”. To assess if CHW involvement in areas of low ANC coverage would result in better effects, we included, as additional subgroup analysis, information on baseline or control arm ANC coverage. High ANC4+ was defined as coverage of  $\geq 50\%$  (the mean number of ANC visits across sub-Saharan Africa has been reported as 3.8).<sup>13</sup> Gonzalez et al. suggested that baseline IPTp coverage may affect the intervention result.<sup>4</sup> To examine this further we added a subgroup analysis by baseline coverage of IPTp. High IPTp2+ was defined as a baseline or

control arm coverage of  $\geq 60\%$ , the first target for coverage, and high IPTp3+ as baseline or control arm coverage of  $\geq 40\%$ . The cutoffs were based on old guidelines for IPTp2+ coverage and for IPTp3+ on the variability of the data.<sup>14</sup>

Supplementary results

Table 3: Intervention characteristics, chronologically

Study Author, year	Objective	Intervention strategy	Duration	1st SP dose in ANC?	Pre-existing CHWs in health system?	Gender Of CHWs	Selection criteria of CHWs	Training of CHWs	Trainers of CHWs	Payment to CHWs or incentives	Supervision of CHWs	Identification pregnant women	CHW-PW ratio	Community sensitization
Mbonye, 2007 <sup>10,15</sup>	Assess the impact of c-IPTp-SP on access and compliance	Community resource persons* delivered IPTp-SP and other health services to PW. Home visits by CHWs and encouragement of involvement of spouses	17 months	No	Yes	Male Female	Pre-existing traditional birth attendants, adolescents peer mobilizers, community reproductive health workers, and drug shop vendors were identified and trained.	1-week training on the dangers of MiP, malaria prevention in pregnancy, benefits of SP and side effects; blood samples collection, measuring baby's weight and estimating GA	NR	Bicycles for transportation	Field supervisor, laboratory assistant and the principal investigator	Enrolment of PW through creating awareness. Women were recruited when they came and sought care/medication from CHWs and through CHWs' home visits	NR	A community mobilization and sensitization campaign was conducted to ensure that all women received information on the intervention and where to get SP
Gies, 2009 <sup>5</sup>	Evaluate the effect of a promotional campaign for women on ANC use and IPTp-SP coverage	Women field assistants screened, recruited women in their first or second pregnancy during monthly village visits, and referred them to ANC and followed up with 2 visits	24 months	Yes	No	Female	Female leaders selected with the agreement of community representatives. Selection from all sub-villages to cover the variety of local ethnic groups and languages between these villages	2-day training courses on all relevant aspects of ANCs and IPTp-SP, and on the use of the image boxes, animation techniques for individuals, and group discussions	Social scientist	NR	Social scientist	Identification and recruitment of PW done by the CHWs during the monthly village visits	NR	Twice-a-month sensitization sessions on malaria, ANC and IPTp by the selected women leaders. Health Market Days
Msyamboza, 2009 <sup>8</sup>	Assess the impact of c-IPTp on uptake	Community promotion of ANC and delivery of IPTp-SP by CHWs	24 months	No	No	Female	Women who taught AGLIT curriculum were selected and acted as CHWs in their respective villages. If there was no female teacher, another literate woman was chosen by the village	Training on data collection, how to encourage PW in their villages to attend ANC at their respective hospitals, how to measure birth weight, and fundal height	NR	NR	NR	Women either voluntarily approached CHWs for enrolment in the study or were actively sought out by the CHWs	1 CHW per village	Community awareness meetings were held in all selected villages. Meetings were conducted every 3 months in each village to identify challenges and issues

Ndyomugenyi, 2009 <sup>9</sup>	Evaluate the impact of c-IPTp on uptake	Community promotion of ANC and promotion and delivery of IPTp by community drug distributors	12 months	No	Yes	NR	CHWs from the onchocerciasis control programme	2-day training on the dangers of malaria to both the mother and foetus and on how to administer IPTp-SP by DOT	NR	NR	Health facility workers	Pregnant women went to the CHWs' homes, or to the health facility	NR	Health education on malaria and its dangers for mother and foetus through participatory community meetings at a central level in villages
Okeibunor, 2011 <sup>6</sup>	Increase access to malaria prevention (IPT/ITN) among PW	CHWs delivered ITNs and SP (IPTp1 and IPTp2) to PW, provided basic health counselling services, referred PW to HF for additional ANC services	30 months	No	No	Female	The selection of CHWs delegated to each kindred, extended family units or clans with a common ancestry, within a given community. Priority given to women with prior childbearing experience	Training on how to deliver ITNs and SP to PW, and how to provide basic health counselling services, and ANC promotion	Staff of the nearest health facility	NR	Staff of the nearest health facility	CHWs identified PW in the community	1 CHW per 23 births per calendar year	Community stakeholders' engagement and sensitization by health workers in local meetings
Wangalwa, 2012 <sup>7</sup>	Evaluate the effectiveness of community-based delivery of maternal and newborn care intervention on adoption of services	Community promotion of ANC and delivery of other maternal and newborn care	22 months	Yes	Yes	NR	Elections during meetings convened by the respective village elders. Eligibility criteria include ability to read and write, permanent residence in the community and demonstrated commitment to the service of their neighbours	7-day training on community-maternal and newborn care	Community health extension workers	NR	Community health extension workers	CHWs identified PW in the community.	2 per village	Meetings with community health committee, including an average of 12 elected members by the community
Orobaton, 2016 <sup>11</sup>	Examine scale up mechanisms enabling SP uptake, community acceptance,	Community promotion of ANC and promotion and delivery of IPTp-SP by CHWs in addition to	8 months	No	Yes	NR	Built in the health system	Training on WHO prescribed counselling messages, SP delivery, identification of adverse events.	NR	NR	Facility health worker	Household mapping and enumeration of WRA and PW	15 CHWs per ward, 6-10 per 10,000 residents	Bi-monthly meeting with Legal Government Area level stakeholders

	and delivery cost	promotion of HF delivery												
COSMIC Consortium, 2018 <sup>3</sup>	Assess the impact of the addition of CSST to standard IPTp-SP on maternal and infant health.	CHWs visited women in their houses monthly, screened and treated them if RDT positive, and encouraged them to attend ANC visits.	24 months			Male Female	NR	CHWs in the intervention arm were trained in malaria case management and MiP, including the benefit of early ANC attendance and IPTp-SP	NR	NR	NR	Recruitment was done at 1 <sup>st</sup> ANC visit, and continuous identification of PW in the community by CHWs	NR	Community sensitization and involvement of community leaders, appropriate community meetings
Burkina Faso				Yes	Yes									
Gambia				Yes	Yes									
Benin				Yes	Yes									
Gutman, 2020 <sup>1</sup>	Assess the effect of c-IPTp-SP on coverage	CHWs delivered IPTp-SP to women and promoted ANC attendance.	15 months	Yes	Yes	Male Female	Female volunteers recruited from the community to complete pairs of existing male and female CHWs so that only females conducted home visits for cultural purposes.	2-day training focused on mastery of data collection tools, ethical rules, potential adverse events related to SP administration	Health facility workers	US \$35 per month	Health facility workers	PW recruited from the health facilities during the ANC visits and referred to CHWs	1 CHW per 20 PW	NR
Rubenstein, 2022 <sup>2</sup>	Assess the effect of c-IPTp on coverage	Community promotion of ANC and promotion and delivery of IPTp-SP by CHWs	21 months	Yes	Yes	Male Female	CHWs are the lowest cadre of service providers within the MoH; plus volunteers called Secret Mothers.	3-day training on how to provide follow-up IPTp to PW, community-based maternal and newborn health, record-keeping for the study registers and ANC cards.	NR	NR	Study personnel	CHWs worked with community leaders, supervisors and health facility staff to identify PW.	1 CHW per 140 PW	Collaboration with NGOs; 1-day education for the Area Development Committees
Gonzalez 2023 <sup>4</sup>	Assess the effect of c-IPTp-SP on coverage	CHWs delivered IPTp-SP to women and promoted ANC attendance.	18 months-30 months			NR	NR	CHWs were trained to identify PW in the community, to screen them for eligibility to receive IPTp-SP, to deliver IPTp per the WHO guidelines, and to refer women to ANC	NR	NR	NR	Identification and recruitment of pregnant women done by the CHWs in the community		NR
DRC				Yes	Yes								1 CHW per 20 PW	
Madagascar				No	Yes								1 CHW per 28 PW	
Mozambique				No	Yes								1 CHW per 207 PW	

Nigeria				Yes	Yes								1 CHW per 43 PW	
Kayentao 2023 <sup>12</sup>	Assess whether proactive pregnancy detection by CHWs will increase ANC indicators	Trained CHWs went door to door to identify PW, deliver ANC and other services and refer PW to HF	24 months-36 months	Yes	Yes	Male Female	Local community members— female candidates encouraged—who can read and write in French	CHWs trained to proactively identify PW and provide a comprehensive package of primary health care services	NR	40,000 Fcfa (about \$80 US) per month	NR	Proactive identification of PW by CHWs in the community through administration of pregnancy test	1 CHW per 700 population	Community consultation and meetings with community leaders and women's and youth associations

Abbreviations: AGLIT, an adolescent girls literacy project. ANC, antenatal clinic. CHW, community health worker. c-IPTp, intermittent preventive treatment delivered by community health workers. CSST, Community-based Scheduled Screening and Testing. DOT, directly observed treatment. GA: gestational age. HF, health facility. ITN, insecticide treated net. MiP: malaria in pregnancy; NR: not reported. PW, pregnant women. RDT, rapid diagnostic malaria test. WHO, World Health Organization. WRA: Women of reproductive age.




\*Community resource persons include traditional health attendants (TBAs), community reproductive health workers (CRHWs), adolescent peer mobilizers (APMs), and drug-shop vendors (DSVs).



Supplementary Figure 1: Risk of bias assessment of randomized controlled trials

		Risk of bias domains						
		D1	D1b	D2	D3	D4	D5	Overall
Study	COSMIC Consortium 2018	-	+	+	+	-	+	+
	Gies 2009	X	-	+	+	+	-	-
	Gutman 2020	+	+	+	+	+	+	+
	Rubenstein 2022	+	+	+	+	-	+	+
	Kayentao 2023	-	+	-	+	-	+	-

Domains:  
D1 : Bias arising from the randomization process.  
D1b: Bias arising from the timing of identification and recruitment of Individual participants in relation to timing of randomization.  
D2 : Bias due to deviations from intended intervention.  
D3 : Bias due to missing outcome data.  
D4 : Bias in measurement of the outcome.  
D5 : Bias in selection of the reported result.

Judgement  
 High  
 Some concerns  
 Low

The majority of the randomized controlled trials were graded good quality, with risks of bias ranging from low to some concerns. Only two of the five RCTs were graded as having some concerns mostly due to a risk of bias in the randomization process.

Supplementary Figure 2: Risk of bias assessment of non-randomized studies

Five out of the seven non-randomized studies, however, were graded low in quality mostly due to high risk of confounding bias, and outcome measurement bias. Only one non-randomized study was graded as good quality with a low risk of bias.

		Risk of bias domains							
		D1	D2	D3	D4	D5	D6	D7	Overall
Study	Mbonye 2007								
	Msyamboza 2009								
	Ndyomugenyi 2009								
	Okeibunor 2011								
	Orobaton 2016								
	Wangalwa 2012								
	Gonzalez 2023								

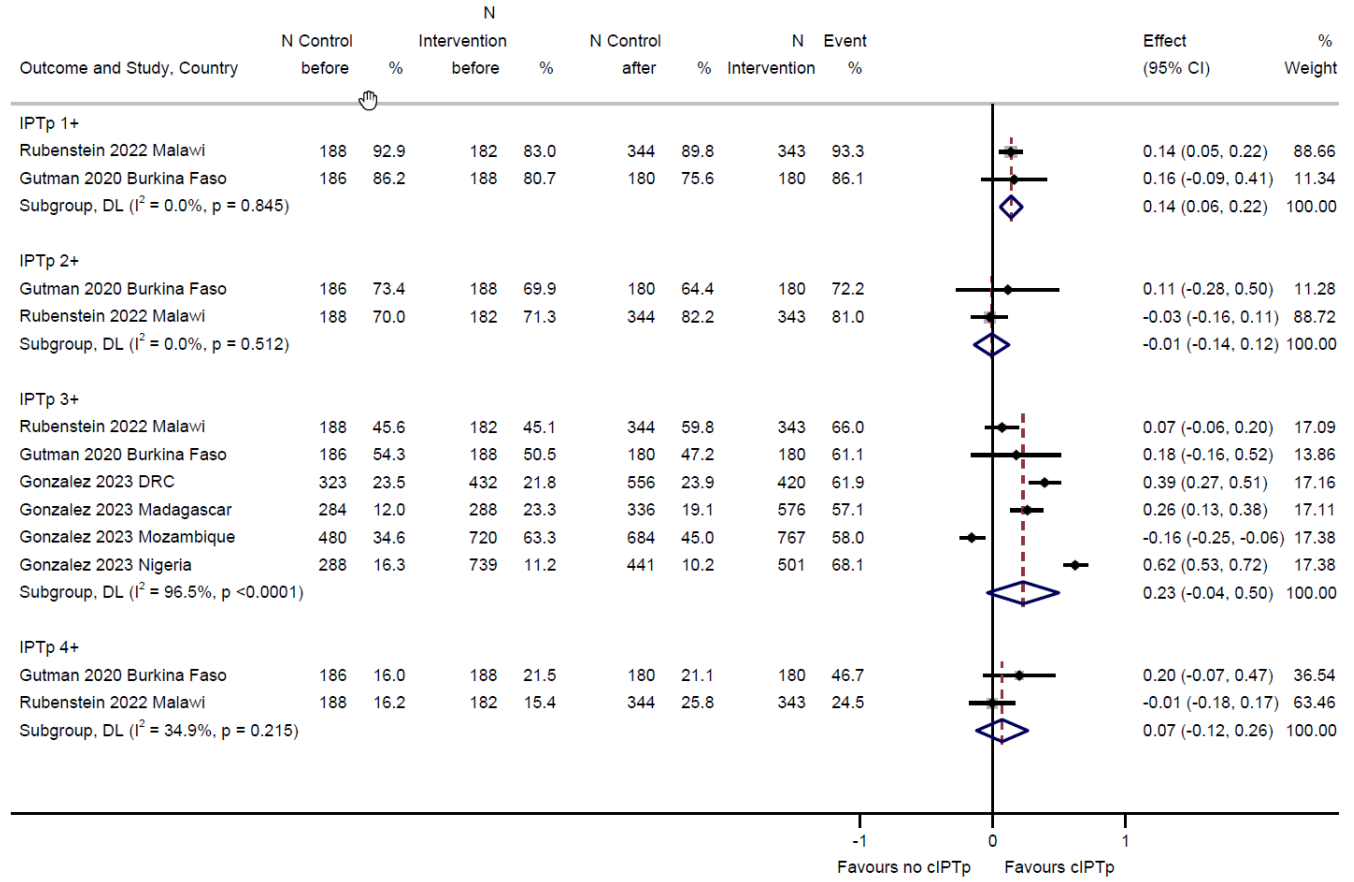
Domains:

- D1: Bias due to confounding.
- D2: Bias due to selection of participants.
- D3: Bias in classification of interventions.
- D4: Bias due to deviations from intended interventions.
- D5: Bias due to missing data.
- D6: Bias in measurement of outcomes.
- D7: Bias in selection of the reported result.

Judgement

- Serious
- Moderate
- Low

Supplementary Figure 3: Forest plot of difference-in-differences by doses of IPTp in studies comparing IPTp with sulfadoxine-pyrimethamine provided by community health workers versus IPTp in the antenatal clinic only



Abbreviation: CI, confidence interval. DL, DerSimonian and Laird (method). DRC, Democratic Republic of Congo. IPTp, intermittent preventive treatment in pregnancy.

Supplementary Table 4. Subgroup analyses, including sensitivity analyses, for effects of interventions on number of doses of IPTp

Subgroup analyses	N Sub-studies	No cluster adjustment*			ICC estimate of 0.02 used*			ICC estimate of 0.06 used*			ICC estimate of 0.09 used*			ICC estimate of 0.20 used*		
		Pooled RR, 95% CI	I <sup>2</sup> , %	p†	Pooled RR, 95% CI	I <sup>2</sup> , %	p†	Pooled RR, 95% CI	I <sup>2</sup> , %	p†	Pooled RR, 95% CI	I <sup>2</sup> , %	p†	Pooled RR, 95% CI	I <sup>2</sup> , %	p†
IPTp2+																
Intervention type																
c-IPTp	8	<b>1·88, 1·18-3·00</b>	99·5	0·18	<b>1·86, 1·37-2·51</b>	96·7	0·17	<b>1·81, 1·37-2·40</b>	93·1	0·16	<b>1·78, 1·34-2·36</b>	91·1	0·18	<b>1·69, 1·28-2·23</b>	83·1	0·15
ANC prom/c-IST	3	1·02, 0·99-1·06	0·0		1·02, 0·99-1·06	0·0		1·02, 0·99-1·06	0·0		1·02, 0·99-1·06	0·0		1·02, 0·99-1·06	0·0	
ANC prom	1	<b>1·44, 1·11-1·69</b>	-		<b>1·44, 1·11-1·69</b>	-		<b>1·44, 1·11-1·69</b>	-		<b>1·44, 1·11-1·69</b>	-		<b>1·44, 1·11-1·69</b>	-	
CHW home visits	0	-	-		-	-		-	-		-	-		-	-	
c-IPTp vs no c-IPTp																
c-IPTp	8	<b>1·88, 1·18-3·00</b>	99·5	0·0773	<b>1·86, 1·37-2·51</b>	96·7	0·0744	<b>1·81, 1·37-2·40</b>	93·1	0·0713	<b>1·78, 1·34-2·36</b>	91·1	0·0794	<b>1·69, 1·28-2·23</b>	83·1	0·0771
No c-IPTp	4	1·05, 0·95-1·17	74·0		1·05, 0·95-1·17	74·0		1·05, 0·95-1·17	74·0		1·05, 0·95-1·17	74·0		1·05, 0·95-1·17	74·0	
First dose in ANC																
Yes	7	<b>1·11, 1·00-1·23</b>	84·7	0·0226	1·10, 0·99-1·22	80·7	0·0220	1·09, 0·98-1·20	75·4	0·0190	1·07, 0·97-1·18	72·5	0·0153	1·06, 0·97-1·17	66·3	0·0039
No	5	<b>2·25, 1·32-3·86</b>	99·4		<b>2·21, 1·64-2·98</b>	94·8		<b>2·12, 1·62-2·76</b>	86·7		<b>2·07, 1·59-2·71</b>	81·5		<b>1·96, 1·53-2·51</b>	58·2	
First dose in ANC																
Yes & c-IPTp	3	1·32, 0·95-1·82	92·7	0·0685	1·34, 0·87-2·06	89·7	0·0679	1·31, 0·89-1·92	84·0	0·0619	1·26, 0·87-1·82	80·4	0·0580	1·18, 0·85-1·64	67·0	0·0242
No & c-IPTp	5	<b>2·25, 1·32-3·86</b>	99·4		<b>2·21, 1·64-2·98</b>	94·8		<b>2·12, 1·62-2·76</b>	86·7		<b>2·07, 1·59-2·71</b>	81·5		<b>1·96, 1·53-2·51</b>	58·2	
No c-IPTp	4	1·05, 0·95-1·17	74·0		1·05, 0·95-1·17	74·0		1·05, 0·95-1·17	74·0		1·05, 0·95-1·17	74·0		1·05, 0·95-1·17	74·0	
First dose in ANC (c-IPTp studies only)																
Yes & c-IPTp	3	1·32, 0·95-1·82	92·7	0·22	1·34, 0·87-2·06	89·7	0·22	1·31, 0·89-1·92	84·0	0·21	1·26, 0·87-1·82	80·4	0·19	1·18, 0·85-1·64	67·0	0·10
No & c-IPTp	5	<b>2·25, 1·32-3·86</b>	99·4		<b>2·21, 1·64-2·98</b>	94·8		<b>2·12, 1·62-2·76</b>	86·7		<b>2·07, 1·59-2·71</b>	81·5		<b>1·96, 1·53-2·51</b>	58·2	
ANC4+ baseline																

<50%	9	<b>1·71, 1·07-2·73</b>	99·6	0·33	<b>1·67, 1·29-2·17</b>	97·6	0·34	<b>1·60, 1·29-2·00</b>	95·8	0·36	<b>1·55, 1·26-1·91</b>	94·6	0·37	<b>1·42, 1·19-1·71</b>	91·0	0·41
≥50%	3	1·21, 0·87-1·67	97·3		1·21, 0·85-1·71	94·5		1·21, 0·89-1·64	88·0		1·20, 0·88-1·63	85·2		1·18, 0·90-1·54	69·7	
IPTp2+ baseline																
<60%	8	<b>1·81, 1·11-2·96</b>	99·4	0·18	<b>1·78, 1·31-2·42</b>	96·9	0·18	<b>1·73, 1·30-2·29</b>	95·1	0·19	<b>1·69, 1·28-2·23</b>	94·0	0·19	<b>1·58, 1·22-2·06</b>	90·8	0·23
≥60%	4	1·18, 0·95-1·45	96·9		1·16, 0·97-1·38	90·7		1·13, 0·97-1·31	78·1		1·10, 0·95-1·27	69·8		1·07, 0·94-1·22	47·3	
IPTp3+ baseline																
<40%	6	<b>2·02, 1·10-3·71</b>	99·3	0·0585	<b>1·99, 1·30-3·05</b>	96·7	0·0594	<b>1·94, 1·30-2·90</b>	94·2	0·0618	<b>1·92, 1·29-2·86</b>	92·9	0·0638	<b>1·79, 1·23-2·62</b>	88·6	0·0737
≥40%	4	1·02, 0·99-1·05	1·7		1·02, 0·99-1·05	0·0		<b>1·03, 1·00-1·06</b>	0·0		1·03, 0·99-1·06	0·0		<b>1·03, 1·00-1·06</b>	0·0	
Design																
QE-parallel	5	<b>2·25, 1·32-3·86</b>	99·4	0·0165	<b>2·21, 1·64-2·98</b>	94·8	0·0158	<b>2·12, 1·62-2·76</b>	86·7	0·0121	<b>2·07, 1·59-2·71</b>	81·5	0·0105	<b>1·96, 1·53-2·51</b>	58·2	0·0042
Before-After	1	<b>2·45, 1·74-3·45</b>	-		<b>2·43, 1·64-3·62</b>	-		<b>2·47, 1·51-4·03</b>	-		<b>2·42, 1·40-4·19</b>	-		<b>2·43, 1·19-4·96</b>	-	
Cluster-RCT	6	1·04, 0·97-1·11	65·2		1·04, 0·96-1·11	61·4		1·04, 0·97-1·12	59·1		1·04, 0·96-1·12	60·3		1·04, 0·96-1·13	59·3	
Quality assessment																
Moderate	5	<b>1·66, 1·53-1·81</b>	53·5	0·58	<b>1·66, 1·51-1·81</b>	35·8	0·56	<b>1·65, 1·49-1·82</b>	17·8	0·50	<b>1·64, 1·50-1·80</b>	0·0	0·47	<b>1·63, 1·45-1·83</b>	0·0	0·24
Good	7	1·45, 0·84-2·50	99·7		<b>1·42, 1·11-1·82</b>	97·4		<b>1·32, 1·09-1·60</b>	94·0		<b>1·26, 1·05-1·50</b>	91·8		1·13, 0·98-1·30	83·3	
IPTp3+														‡		
Intervention type																
c-IPTp	6	<b>2·14, 1·27-3·63</b>	99·0	0·37	<b>2·14, 1·22-3·75</b>	98·8	0·38	<b>2·13, 1·21-3·76</b>	98·3	0·39	<b>2·13, 1·21-3·76</b>	97·9	0·39	<b>2·12, 1·21-3·73</b>	96·7	0·49
ANC prom/c-IST	3	1·15, 0·88-1·51	28·7		1·11, 0·96-1·27	0·0		1·10, 0·91-1·34	0·0		1·11, 0·88-1·39	0·0		1·10, 0·79-1·53	0·0	
ANC prom	0	-	-		-	-		-	-		-	-		-	-	
CHW home visits	1	1·06, 0·97-1·15	-		1·06, 0·97-1·15	-		1·06, 0·97-1·15	-		1·06, 0·97-1·15	-		1·06, 0·97-1·15	-	
c-IPTp vs no c-IPTp																
c-IPTp	6	<b>2·14, 1·27-3·63</b>	99·0	0·15	<b>2·14, 1·22-3·75</b>	98·8	0·15	<b>2·13, 1·21-3·76</b>	98·3	0·16	<b>2·13, 1·21-3·76</b>	97·9	0·16	<b>2·12, 1·21-3·73</b>	96·7	0·22
No c-IPTp	4	<b>1·08, 1·01-1·16</b>	9·3		1·07, 1·00-1·15	0·0		1·07, 0·99-1·15	0·0		1·07, 0·98-1·15	0·0		1·06, 0·98-1·15	0·0	
First dose in ANC																
Yes	8	<b>1·60, 1·06-2·41</b>	98·3	0·57	<b>1·59, 1·01-2·52</b>	97·9	0·57	1·60, 0·99-2·58	97·2	0·59	1·60, 0·99-2·60	96·7	0·59	<b>1·66, 1·01-2·74</b>	95·6	0·66

No	2	2·18, 0·60-7·98	99·5		2·19, 0·60-8·03	99·3		2·17, 0·60-7·92	99·1		2·17, 0·60-7·85	98·9		<b>2·16, 0·60-7·80</b>	98·2	
First dose in ANC																
Yes & c-IPTp	4	<b>2·13, 1·06-4·27</b>	98·9	0·37	<b>2·11, 1·02-4·37</b>	98·4	0·38	<b>2·12, 1·05-4·26</b>	97·5	0·39	<b>2·11, 1·06-4·21</b>	96·8	0·39	<b>2·11, 1·06-4·19</b>	95·0	0·50
No & c-IPTp	2	2·18, 0·60-7·98	99·5		2·19, 0·60-8·03	99·3		2·17, 0·60-7·92	99·1		2·17, 0·60-7·85	98·9		2·16, 0·60-7·80	98·2	
No c-IPTp	4	<b>1·08, 1·01-1·16</b>	9·3		<b>1·07, 1·00-1·15</b>	0·0		1·07, 0·99-1·15	0·0		1·07, 0·98-1·15	0·0		1·06, 0·98-1·15	0·0	
First dose in ANC (c-IPTp studies only)																
Yes & c-IPTp	4	<b>2·13, 1·06-4·27</b>	98·9	0·97	<b>2·11, 1·02-4·37</b>	98·4	0·96	<b>2·12, 1·05-4·26</b>	97·5	0·97	<b>2·11, 1·06-4·21</b>	96·8	0·97	<b>2·11, 1·06-4·19</b>	95·0	0·98
No & c-IPTp	2	2·18, 0·60-7·98	99·5		2·19, 0·60-8·03	99·3		2·17, 0·60-7·92	99·1		2·17, 0·60-7·85	98·9		2·16, 0·60-7·80	98·2	
ANC4+ baseline																
<50%	5	1·41, 0·89-2·25	97·6	0·41	1·42, 0·85-2·36	97·1	0·43	1·42, 0·81-2·47	96·1	0·44	1·41, 0·80-2·51	95·4	0·45	1·49, 0·80-2·75	94·6	0·56
≥50%	5	<b>2·02, 1·12-3·64</b>	99·1		<b>2·01, 1·05-3·85</b>	98·8		<b>2·00, 1·03-3·88</b>	98·4		<b>2·00, 1·03-3·89</b>	98·0		<b>1·99, 1·03-3·83</b>	96·8	
IPTp2+ baseline																
<60%	7	<b>2·04, 1·21-3·43</b>	98·9	0·23	<b>2·08, 1·24-3·49</b>	98·7	0·19	<b>2·11, 1·27-3·51</b>	98·3	0·18	<b>2·12, 1·28-3·51</b>	98·0	0·18	<b>2·25, 1·36-3·70</b>	97·4	0·16
≥60%	3	<b>1·13, 1·04-1·22</b>	15·9		<b>1·10, 1·00-1·22</b>	0·0		1·12, 0·98-1·27	0·0		1·13, 0·97-1·31	0·0		1·13, 0·93-1·37	0·0	
IPTp3+ baseline																
<40%	6	<b>2·17, 1·23-3·82</b>	99·1	0·19	<b>2·22, 1·27-3·86</b>	98·9	0·15	<b>2·21, 1·29-3·78</b>	98·6	0·16	<b>2·21, 1·20-3·74</b>	98·3	0·16	<b>2·31, 1·38-3·87</b>	97·9	0·15
≥40%	4	<b>1·13, 1·05-1·22</b>	12·7		<b>1·11, 1·01-1·22</b>	0·0		1·12, 0·98-1·28	0·0		1·13, 0·97-1·31	0·0		1·13, 0·93-1·38	0·0	
Design																
QE-parallel	0	-	-		-	-		-	-		-	-		-	-	
Before-After	4	<b>2·87, 1·30-6·37</b>	99·4	0·0185	<b>2·87, 1·29-6·37</b>	99·2	0·0174	<b>2·86, 1·29-6·33</b>	98·9	0·0193	<b>2·85, 1·29-6·30</b>	98·7	0·0204	<b>2·85, 1·29-6·33</b>	97·9	0·0298
Cluster-RCT	6	<b>1·11, 1·04-1·18</b>	20·3		<b>1·08, 1·01-1·15</b>	0·0		<b>1·08, 1·00-1·16</b>	0·0		<b>1·08, 1·00-1·16</b>	0·0		1·07, 0·99-1·16	0·0	
Quality assessment																
Moderate-to-low	4	<b>2·87, 1·30-6·37</b>	99·4	0·0185	<b>2·87, 1·30-6·37</b>	99·2	0·0174	<b>2·86, 1·29-6·33</b>	98·9	0·0193	<b>2·85, 1·29-6·30</b>	98·7	0·0204	<b>2·85, 1·29-6·33</b>	97·9	0·0298
Good	6	<b>1·11, 1·04-1·18</b>	20·3		<b>1·08, 1·01-1·15</b>	0·0		<b>1·08, 1·00-1·16</b>	0·0		<b>1·08, 1·00-1·16</b>	0·0		1·07, 0·99-1·16	0·0	

Abbreviations: ANC: antenatal clinic. Before-after: study design where an intervention is implemented and compared with a baseline survey. cIST: intermittent screening and testing for malaria by community health workers. c-IPTp: intermittent preventive treatment provided by community health workers (as opposed to ANC only). CHW: community health workers. ICC: intraclass correlation coefficient. IPTp: intermittent

preventive treatment in pregnancy. QE-parallel: quasi-experimental study with parallel design (control and intervention group measured at the same time). RCT: randomized controlled trial. ANC prom: intervention by CHWs to promote ANC attendance and IPTp coverage. In bold effect estimates with a p-value of <0.05.

\*No cluster adjustment for studies for which adjusted risk ratios or odds ratios were not available. For studies which had an adjusted risk ratio or odds ratio available, this was always used in meta-analysis. The cluster adjustment involved the following studies: Mbonye 2007 Uganda,<sup>10,15</sup> Msyamboza 2009 Uganda,<sup>8</sup> Ndyomugenyi 2009 Uganda,<sup>9</sup> Okeibunor 2011 Nigeria,<sup>6</sup> Orobato 2016 Nigeria,<sup>11</sup> Rubenstein 2022 Malawi,<sup>2</sup> Wangalwa 2012 Kenya.<sup>7</sup> For Gutman 2020 Burkina Faso, an ICC of 0.09 was used for all calculations, because that was the ICC they reported.<sup>1</sup>

†P-value for the subgroup analysis, obtained by meta-regression

‡ For IPTp3+ and an ICC estimate of 0.20 one sub-study could not be included because of 0 values in prevalence estimates

Supplementary Table 5. Meta-analyses for effect of interventions on number of doses of IPTp

Outcome IPTp	N sub-studies	No cluster adjustment*		ICC estimate of 0.02 used*		ICC estimate of 0.06 used*		ICC estimate of 0.09 used*		ICC estimate of 0.20 used*	
		Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %	Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %	Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %	Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %	Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %
IPTp1+	7	<b>1.25, 1.17-1.33</b> 0.99-1.58	99.8	<b>1.07, 1.04-1.11</b> 0.96-1.19	97.6	<b>1.05, 1.01-1.09</b> 0.94-1.18	94.0	<b>1.05, 1.00-1.09</b> 0.91-1.20	91.9	1.04, 0.99-1.10 0.89-1.22	82.6
IPTp2+	12	<b>1.56, 1.11-2.21</b> 0.38-6.37	99.5	<b>1.53, 1.26-1.87</b> 0.71-3.32	97.1	<b>1.48, 1.24-1.75</b> 0.77-2.84	94.7	<b>1.44, 1.22-1.69</b> 0.78-2.65	93.2	<b>1.34, 1.16-1.56</b> 0.81-2.24	88.5
IPTp3+	10	<b>1.71, 1.22-2.41</b> 0.49-6.04	98.5	<b>1.72, 1.19-2.48</b> 0.45-6.50	98.2	<b>1.73, 1.19-2.50</b> 0.46-6.50	97.5	<b>1.73, 1.20-2.50</b> 0.47-6.42	97.0	<b>1.77, 1.23-2.54†</b> 0.49-6.45	95.8
IPTp4+	4	1.33, 0.83-2.15 0.18-10.01	82.5	1.20, 0.86-1.68 0.36-1.68	45.0	1.23, 0.83-1.80† 0.02 to 73.6	56.5	1.25, 0.84-1.84† 0.02-75.2	52.9	1.27, 0.83-1.95† 0.02-107.19	50.6
IPTp5+	2	2.93, 0.18-47.08	95.9	2.73, 0.15-49.06	86.9	2.75, 0.15-50.70	85.9	2.81, 0.15-51.33	84.7	2.98, 0.17-52.19	81.7
<i>Without study of Orobaton 2016</i>											
IPTp1+	6	<b>1.01, 1.00-1.02</b>	89.6	1.01, 0.99-1.02	86.2	1.02, 0.99-1.04	79.9	1.02, 0.99-1.05	78.4	1.02, 0.99-1.06	58.4
IPTp2+	11	<b>1.39, 1.16-1.65</b>	97.5	<b>1.38, 1.16-1.63</b>	96.0	<b>1.36, 1.16-1.59</b>	93.8	<b>1.34, 1.15-1.56</b>	92.4	<b>1.29, 1.12-1.48</b>	87.7

Abbreviations: ICC; intracluster correlation coefficient. IPTp: intermittent preventive treatment in pregnancy. RR: risk ratio

\*No cluster adjustment for studies for which adjusted risk ratios or odds ratios were not available. For studies which had an adjusted risk ratio or odds ratio available, this was always used in meta-analysis.

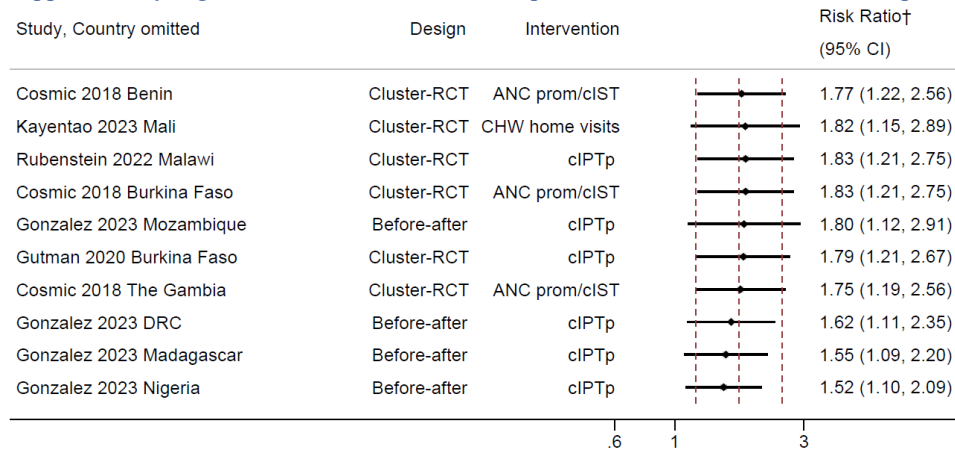
†One sub-study was not included because of 0 values.



## Influence of individual sub-studies on pooled estimate for IPTp3+ and funnel plot

A “leave-one-out” forest plot showing the effect when each study is removed on the pooled IPTp3+ coverage is presented in Supplementary Figure 4. Effects of three sub-studies (Gonzalez 2023 in DRC, Madagascar and Nigeria) contributed relatively more than all others.<sup>4</sup> Publication and small study effect biases were assessed for IPTp3+ using Egger’s test and visual inspection of the funnel plot (Supplement Figure 5). There was no clear indication of asymmetry, but the number of sub-studies was low (Egger’s test  $p=0.35$ ).

Supplementary Figure 4: “Leave-one-out” forest plot for three or more doses of IPTp

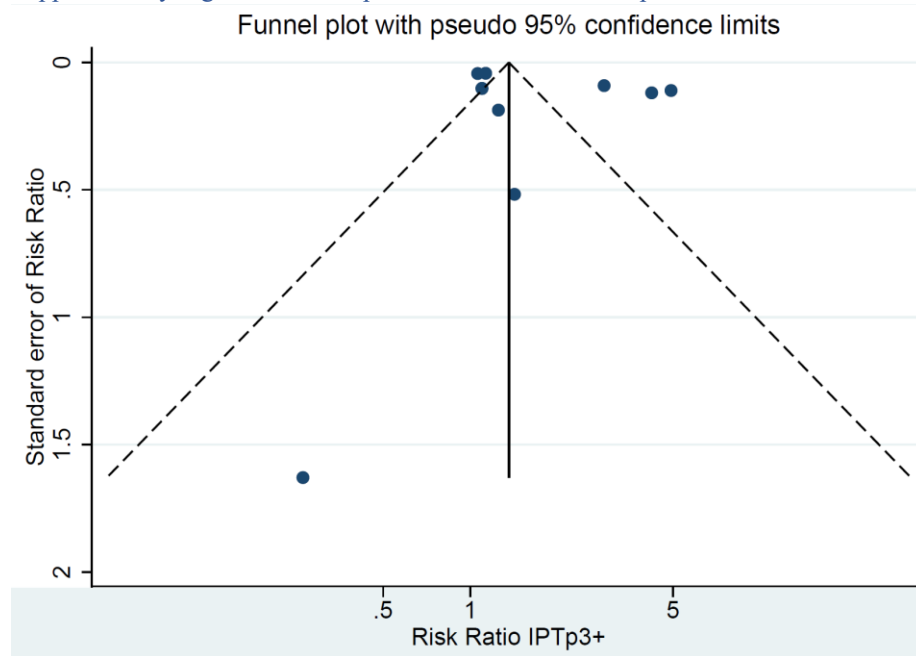


Abbreviations: ANC prom, intervention by community health workers to promote ANC attendance and IPTp coverage. CHW, Community Health Worker. c-IPTp, intermittent preventive treatment delivered by community health workers (in addition to ANC). cIST, intermittent screening and treatment delivered by community health workers. Cluster-RCT, cluster randomized controlled trial. QE-parallel, quasi experimental trial with parallel arms. Before-after, a post-intervention survey is compared to a baseline survey. IPTp, intermittent preventive treatment in pregnancy. DRC, Democratic Republic of Congo.

† The pooled RR for IPTp3+ among these 10 studies was 1.73, 1.19-2.50 (ICC 0.06, see Supplementary table 5), which is indicated in the graph with the middle red dotted vertical line. In this graph, each study is removed one by one, so the effect of each study on the overall estimate can be assessed. E.g., when the Cosmic 2018 study in Benin was removed,<sup>3</sup> the overall pooled estimate increased from 1.73 to 1.77. From the graph it can be deduced that the studies that have the largest effect on the overall estimate are the bottom three studies, by Gonzalez et al (2023) in DRC, Madagascar, and Nigeria.<sup>4</sup> Removal of these studies reduced the effect, indicating that the effect in these countries must be higher than the overall pooled estimate. In Figure 2, it can be seen that these studies have an effect size of close to 3 or higher, e.g., resulted in large increases in IPTp3+, unlike all the other studies.

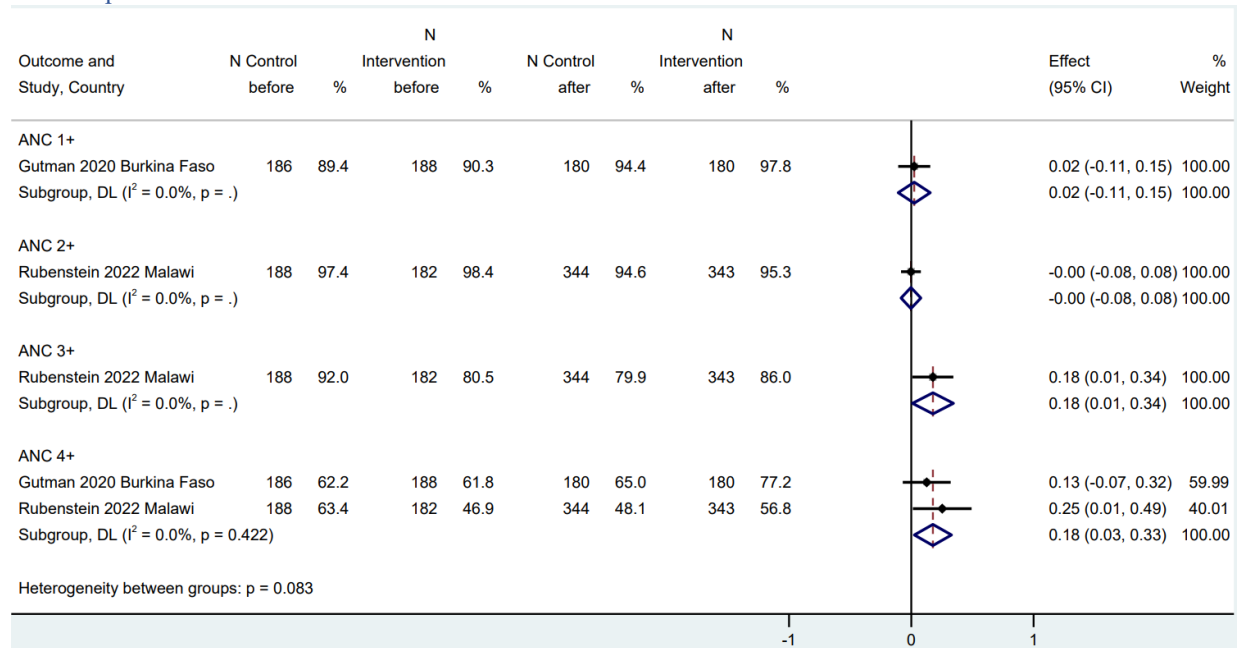
Publication and small study effect biases were assessed for IPTp3+ using Egger's test. Visual inspection of the funnel plot showed no clear indication of asymmetry (Figure 5).

Supplementary Figure 5: Funnel plot for three or more IPTp doses



Abbreviation: IPTp, intermittent preventive treatment in pregnancy (Egger's test  $p=0.35$ ).

Supplementary Figure 6: Forest plot of difference-in-differences for two randomized trials comparing c-IPTp versus no c-IPTp for number of ANC visits



Abbreviation: ANC, antenatal care. c-IPTp, Intermittent preventive treatment in pregnancy delivered in the community by community health workers.

Supplementary Table 6: Meta-analyses for effect of interventions on number of ANC visits

Number of ANC visits	N sub-studies	No cluster adjustment*		ICC estimate of 0.02 used*		ICC estimate of 0.06 used*		ICC estimate of 0.09 used*		ICC estimate of 0.20 used*	
		Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %	Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %	Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %	Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %	Pooled RR, 95% CI and 95% prediction interval	I <sup>2</sup> , %
ANC1+	8	<b>1·02, 1·01-1·03</b> 0·99-1·05	94·3	<b>1·02, 1·01-1·03</b> 0·98-1·06	89·5	<b>1·02, 1·00-1·04</b> 0·97-1·08	82·1	<b>1·02, 1·00-1·04</b> 0·96-1·09	78·1	1·02, 0·99-1·05 0·96-1·09	62·0
ANC2+	7	0·99, 0·89-1·11 0·66-1·51	97·8	0·99, 0·90-1·09 0·71-1·40	94·2	1·00, 0·92-1·08 0·76-1·31	88·2	1·00, 0·92-1·08 0·77-1·29	84·6	1·01, 0·94-1·08 0·83-1·24	69·1
ANC3+	5	<b>1·12, 1·07-1·17</b> 0·99-1·26	25·1	<b>1·12, 1·07-1·18</b> 1·04-1·18	0·0	<b>1·13, 1·06-1·20</b> 1·02-1·25	0·0	<b>1·13, 1·05-1·22</b> 1·01-1·28	0·0	<b>1·14, 1·04-1·26</b> 0·97-1·34	0·0
ANC4+	13	<b>1·18, 1·02-1·37</b> 0·65-2·15	95·5	<b>1·18, 1·02-1·37</b> 0·67-2·08	93·1	<b>1·17, 1·01-1·36</b> 0·67-2·04	90·3	<b>1·18, 1·01-1·37</b> 0·68-2·04	88·1	1·16, 0·99-1·35 0·69-1·94	81·1
<b>Early ANC visit‡</b>											
Early ANC start	5	1·08, 0·99-1·19 0·84-1·39	35·4	1·05, 0·97-1·14 0·92-1·21	0·0	1·05, 0·96-1·16 0·90-1·23	0·0	1·05, 0·95-1·17 0·88-1·25	0·0	1·06, 0·92-1·21 0·85-1·32	0·0

Abbreviations: ANC: antenatal care. ICC; intracluster correlation coefficient. IPTp: intermittent preventive treatment in pregnancy. RR: risk ratio. Pooled risk ratios with a p-value < 0·05 have been printed in bold. Prediction interval

\*Cluster adjustment was used for studies for which adjusted risk ratios or odds ratios were not available. The cluster adjustment was based on the ICC estimate. For studies which had an adjusted risk ratio or odds ratio available, this was always used in meta-analysis for each column. These include the following studies: Gutman 2020 Burkina Faso,<sup>1</sup> Mbonye 2007 Uganda,<sup>10,15</sup> Msyamboza 2009 Uganda,<sup>8</sup> Ndyomugenyi 2009 Uganda,<sup>9</sup> Okeibunor 2011 Nigeria,<sup>6</sup> Orobato 2016 Nigeria,<sup>11</sup> Rubenstein 2022 Malawi,<sup>2</sup> Wangalwa 2012 Kenya.<sup>7</sup>

†One sub-study not included because of 0 values.

‡As defined by study: <14 weeks by Gies *et al.* (2009);<sup>5</sup> in first trimester by Gonzales *et al.* (2023).<sup>4</sup>

Supplementary Table 7: Subgroup analyses, including sensitivity analyses, for effects of interventions on four or more ANC visits

Subgroup analyses	N Sub-studies	No cluster adjustment*			ICC estimate of 0.02 used*			ICC estimate of 0.06 used*			ICC estimate of 0.09 used*			ICC estimate of 0.20 used*		
		Pooled RR, 95% CI	I <sup>2</sup> , %	p†	Pooled RR, 95% CI	I <sup>2</sup> , %	p†	Pooled RR, 95% CI	I <sup>2</sup> , %	p†	Pooled RR, 95% CI	I <sup>2</sup> , %	p†	Pooled RR, 95% CI	I <sup>2</sup> , %	p†
ANC4+																
Intervention																
c-IPTp	9	1.15, 0.97-1.37	96.4	0.80	1.15, 0.96-1.37	94.9	0.84	1.14, 0.95-1.37	92.7	0.90	1.15, 0.96-1.38	91.0	0.87	1.14, 0.94-1.37	84.8	0.93
ANC prom/cIST	2	1.12, 0.75-1.68	46.8		1.20, 0.85-1.69	16.8		<b>1.26, 1.02-1.56</b>	0.0		<b>1.27, 1.03-1.57</b>	0.0		<b>1.27, 1.03-1.57</b>	0.0	
ANC prom	1	<b>1.61, 1.36-1.90</b>	-		<b>1.63, 1.10-2.42</b>	-		1.61, 0.85-3.04	-		1.74, 0.80-3.78	-		1.71, 0.53-5.46	-	
CHW home visits	1	<b>1.25, 1.08-1.43</b>	-		<b>1.25, 1.08-1.43</b>	-		<b>1.25, 1.08-1.43</b>	-		<b>1.25, 1.08-1.43</b>	-		<b>1.25, 1.08-1.43</b>	-	
c-IPTp vs no c-IPTp																
c-IPTp	9	1.15, 0.97-1.37	96.4	0.64	1.15, 0.96-1.37	94.9	0.63	1.14, 0.95-1.37	92.7	0.61	1.15, 0.96-1.38	91.0	0.56	1.14, 0.94-1.37	84.8	0.61
Other than c-IPTp	4	<b>1.32, 1.10-1.58</b>	63.7		<b>1.28, 1.14-1.43</b>	0.0		<b>1.26, 1.13-1.42</b>	0.0		<b>1.27, 1.13-1.42</b>	0.0		<b>1.26, 1.12-1.42</b>	0.0	
First dose in ANC																
Yes	9	<b>1.23, 1.08-1.39</b>	86.7	0.59	<b>1.21, 1.07-1.36</b>	77.5	0.59	<b>1.19, 1.06-1.34</b>	68.2	0.58	<b>1.19, 1.06-1.34</b>	64.1	0.59	<b>1.17, 1.04-1.31</b>	48.7	0.67
No	4	1.11, 0.76-1.61	98.3		1.11, 0.74-1.67	97.7		1.10, 0.72-1.69	96.8		1.12, 0.73-1.72	96.0		1.12, 0.72-1.74	93.4	
First dose in ANC																
Yes & c-IPTp	5	<b>1.17, 1.02-1.35</b>	86.8	0.85	<b>1.17, 1.01-1.34</b>	82.4	0.84	<b>1.15, 1.00-1.33</b>	74.0	0.83	1.15, 0.99-1.34	69.3	0.81	1.11, 0.96-1.28	44.7	0.87
No & c-IPTp	4	1.11, 0.76-1.61	98.3		1.11, 0.74-1.67	97.7		1.10, 0.72-1.69	96.8		1.12, 0.73-1.72	96.0		1.12, 0.72-1.74	93.4	
No c-IPTp	4	<b>1.32, 1.10-1.58</b>	63.7		<b>1.28, 1.14-1.43</b>	0.0		<b>1.26, 1.13-1.42</b>	0.0		<b>1.27, 1.13-1.42</b>	0.0		<b>1.26, 1.12-1.42</b>	0.0	
First dose in ANC																
Yes & c-IPTp	5	<b>1.17, 1.02-1.35</b>	86.8	0.75	<b>1.17, 1.01-1.34</b>	82.4	0.76	<b>1.15, 1.00-1.33</b>	74.0	0.74	1.15, 0.99-1.34	69.3	0.78	1.11, 0.96-1.28	44.7	0.83
No & c-IPTp	4	1.11, 0.76-1.61	98.3		1.11, 0.74-1.67	97.7		1.10, 0.72-1.69	96.8		1.12, 0.73-1.72	96.0		1.12, 0.72-1.74	93.4	
ANC4+ baseline																
<50%	8	1.28, 0.99-1.66	95.3	0.28	<b>1.29, 1.02-1.62</b>	89.9	0.26	<b>1.28, 1.04-1.58</b>	82.6	0.27	<b>1.30, 1.08-1.58</b>	74.1	0.21	<b>1.29, 1.09-1.53</b>	54.9	0.17
≥50%	5	1.05, 0.86-1.28	96.2		1.05, 0.86-1.29	95.1		1.05, 0.85-1.29	93.2		1.05, 0.85-1.30	91.8		1.03, 0.83-1.28	86.0	
IPTp2+ baseline																
<60%	9	<b>1.24, 1.03-1.50</b>	96.1	0.45	<b>1.24, 1.02-1.49</b>	94.7	0.46	<b>1.22, 1.01-1.48</b>	92.6	0.49	<b>1.22, 1.01-1.48</b>	91.2	0.57	1.19, 0.98-1.44	86.2	0.70
≥60%	4	1.07, 0.80-1.43	94.6		1.07, 0.82-1.39	88.3		1.07, 0.83-1.38	79.4		1.11, 0.89-1.38	62.9		1.15, 0.94-1.39	26.3	
IPTp3+ baseline																
<40%	7	1.18, 0.98-1.42	96.1	0.92	1.16, 0.98-1.39	94.5	0.90	1.14, 0.95-1.36	92.4	0.71	1.13, 0.94-1.36	91.0	0.60	1.11, 0.92-1.33	86.0	0.59
≥40%	4	<b>1.19, 1.09-1.30</b>	0.0		<b>1.20, 1.08-1.34</b>	0.0		<b>1.22, 1.07-1.39</b>	0.0		<b>1.24, 1.07-1.43</b>	0.0		<b>1.24, 1.05-1.46</b>	0.0	
Design																
QE-parallel	2	1.27, 0.44-3.66	98.8	0.84	1.27, 0.44-3.69	98.3	0.83	1.25, 0.43-3.69	97.2	0.81	1.30, 0.46-3.62	95.8	0.69	1.30, 0.47-3.60	91.8	0.61
Cluster-RCT	6	<b>1.27, 1.14-1.42</b>	56.9		<b>1.24, 1.14-1.34</b>	0.0		<b>1.24, 1.13-1.36</b>	0.0		<b>1.25, 1.13-1.38</b>	0.0		<b>1.25, 1.12-1.39</b>	0.0	
Before-After‡	5	1.10, 0.89-1.35	96.6		1.10, 0.89-1.35	95.7		1.09, 0.88-1.34	94.1		1.08, 0.87-1.33	92.8		1.06, 0.86-1.32	88.1	
Quality assessment																
Moderate	8	1.19, 0.97-1.46	97.1	0.91	1.18, 0.96-1.44	95.5	0.99	1.16, 0.94-1.42	93.6	0.86	1.16, 0.94-1.43	92.0	0.78	1.14, 0.92-1.41	86.6	0.73
Good	5	<b>1.21, 1.12-1.30</b>	0.0		<b>1.22, 1.12-1.33</b>	0.0		<b>1.23, 1.12-1.36</b>	0.0		<b>1.24, 1.13-1.37</b>	0.0		<b>1.24, 1.12-1.38</b>	0.0	

Abbreviations: ANC: antenatal care. Before-after: study design where an intervention is implemented and compared with a baseline survey. cIST: intermittent screening and testing for malaria by community health workers. c-IPTp: intermittent preventive treatment provided by community health workers (as opposed to ANC only). CHW: community health workers. ICC: intracluster correlation coefficient. IPTp: intermittent

preventive treatment in pregnancy. QE-parallel: quasi-experimental study with parallel design (control and intervention group measured at the same time). RCT: randomized controlled trial. ANC prom: intervention by CHWs to promote ANC attendance and IPTp coverage.

\*No cluster adjustment for studies for which adjusted risk ratios or odds ratios were not available. For studies that had an adjusted risk ratio or odds ratio available, this was always used in meta-analysis.

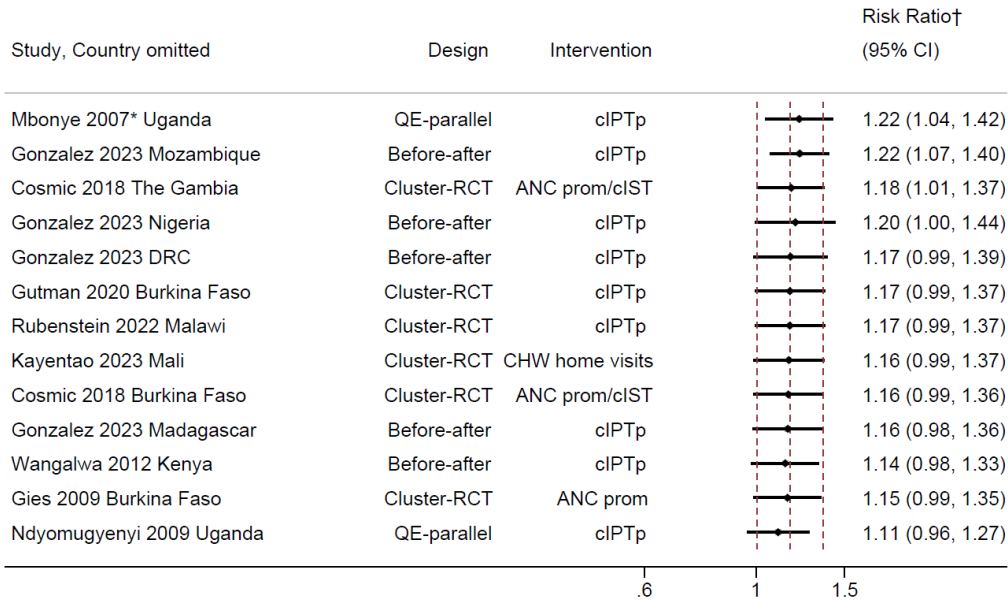
†P-value subgroup analysis, obtained by meta-regression.

‡Comparing Before-After studies and other designs  $p > 0.05$ , e.g., for first column p-value Cluster RCT vs. Before-After:  $p = 0.67$

### Influence of individual sub-studies on pooled estimate for ANC4+ and funnel plot

A “leave-one-out” forest plot showing the effect of when each study is removed on the pooled ANC4+ coverage is presented in Supplementary Figure 7 with one study showing a more extreme effect.<sup>9</sup> Publication and small study effect biases were assessed for ANC4+ using Egger’s test and visual inspection of the funnel plot. There was no clear indication of asymmetry (Egger’s test  $p=0.51$ ) (Supplementary Figure 8).

Supplementary Figure 7: “Leave-one-out” forest plot for four or more ANC visits

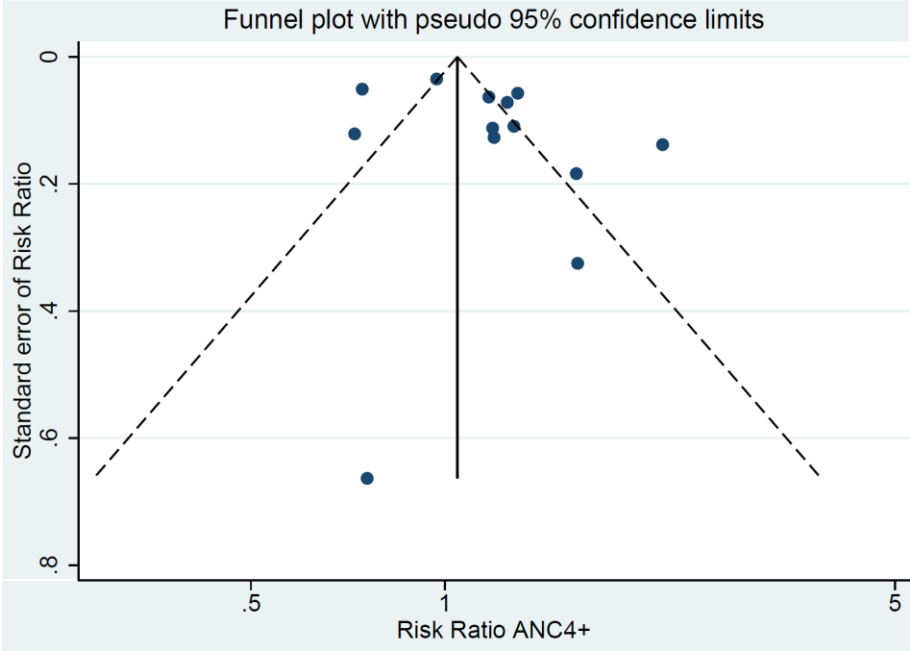


Abbreviations: ANC, antenatal care. ANC prom, intervention by community health workers to promote ANC attendance and IPTp coverage. c-IPTp, intermittent preventive treatment delivered by community health workers (in addition to ANC). cIST, intermittent screening and treatment delivered by community health workers. Cluster-RCT, cluster randomized controlled trial. QE-parallel, quasi experimental trial with parallel arms. Before-after, a post-intervention survey is compared to a baseline survey. IPTp, intermittent preventive treatment in pregnancy. DRC, Democratic Republic of Congo.

\*Denominator for IPTp2+ was women who had received 1 dose of SP

† The pooled RR for ANC4+ among these 13 studies was 1.17, 1.01-1.36 (ICC 0.06, see Supplementary table 6), which is indicated in the graph with the middle red dotted vertical line. In this graph, each study is removed one by one, so the effect of each study on the overall estimate can be assessed. E.g., when the Mbonye 2007 study in Uganda was removed, the overall pooled estimate increased from 1.17 to 1.22. From the graph it can be deduced that the studies that have the largest effect on the overall estimate are by Mbonye et al (2007) in Uganda,<sup>10,15</sup> Gonzalez et al (2023) in Mozambique,<sup>4</sup> and Ndyomugenyeni et al (2009) in Uganda.<sup>9</sup> Removal of the first two studies increased the effect, indicating that the effect in these countries must be lower than the overall pooled estimate, whereas removal of the bottom study results in a decrease, indicating the effect must be higher than the pooled estimate in that study. In Figure 3 it can be seen that the first two studies show a decrease in ANC visits in the intervention arm, whereas the bottom study by Ndyomugenyeni<sup>9</sup> showed an increase of ANC uptake in the intervention arm.

Supplementary Figure 8: Funnel plot for four or more ANC visits



Abbreviation: ANC, antenatal care  
(Egger's test  $p=0.51$ )

Supplementary Table 8: Checklist for quality reporting: Mixed Methods Studies

Author/Year	N	Justification for using mixed methods	Sampling strategy reported		Methods for qualitative component reported	Analysis strategy reported		Multivariate Analysis used	Minimization of bias reported	Integration of Quant/Qual components	Total (9)
			Qualitative	Quantitative		Qual	Quant				
Mbonye 2007 <sup>15</sup>	1429	No	No	Yes	Yes	No	Yes	No	No	Yes	4/9
Okedo-Alex 2022 <sup>16</sup>	817	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	7/9

**Description of categories:**

Justification – authors offer justification for the use of mixed methods in the study.

Sampling – authors report on the sampling techniques for both the qualitative and quantitative participant selection.

Methods – authors report the methodological techniques in data collection for the qualitative components.

Analysis – authors report the analysis strategy used for both the qualitative and quantitative components.

Bias – authors report the steps taken to minimize bias either through study design or in the analysis.

Integration – authors integrate the qualitative and quantitative components in the analysis and findings.

Supplementary Table 9: Checklist for quality reporting: Qualitative studies

Author/Year	N	Sampling strategy is justified	Data collection is clearly explained	Saturation is mentioned	Analysis is clearly explained	Reflexivity is documented	Reliability & Validity is discussed	Use of findings is discussed	Total (7)
Burke 2021 <sup>17</sup>	139	Yes	Yes	No	Yes	No	Yes	Yes	5/7
Alonso 2022 <sup>18</sup>	3235	Yes	Yes	No	Yes	Yes	Yes	Yes	6/7

**Description of categories:**

Sampling strategy – the author mentions who was sampled, how they were sampled and whether or not it is justified.

Data Collection – the methods are described sufficiently in the article, and it mentions if focus group facilitators/interviewers were trained.

Saturation – the author discusses saturation of data.

Analysis – the methods for analysis described and justified.

Reflexivity – the author discusses the effect of the researcher/trial on the data/observations.

Reliability & Validity – triangulation with other data or methods used to confirm/check the results, or validation of the transcripts with the participants to ensure accuracy of data.

Findings – the findings discussed for their implications on further research, policy or programming.



Supplementary Table 10: Themes related to barriers to community IPTp promotion or delivery

Main themes	Secondary themes	Primary themes	References
Malaria knowledge and health care seeking practices	Lack of awareness of malaria prevention in pregnancy, and the intervention	Misconception about malaria transmission	15,16
		Lack of awareness of the negative effects of malaria in pregnancy	15
	lack of women's knowledge on the consequences of malaria in pregnancy	Lack of knowledge on malaria prevention in pregnancy	9,15
	lack of the knowledge of the importance of ANC care	Morbidity and care seeking practices	9,15,17
		Fear of being pricked	15
		Feeling well and not needing medication	9,15
		Negligence	15
Fear of SP side effects and adverse events		Negative perception of SP, rumours about SP	15,16,18,19
		Perceived and experienced side effects	15,16,18,19
Gender inequities in traditional gender roles	Influence on women' health seeking behaviour	Household chores; looking after children; needing relative support; needing husbands' permission; lack of family support;	15,17,19
	Role of CHWs' gender in effectiveness	CHWs' discomfort with certain tasks; male CHWs needing husband's permission to interact with PW; female CHWs needing husband's permission to go to work.	17-19
Socio-cultural and religious influence	Role of CHWs' gender in effectiveness.	Pregnancy disclosure norms;	9,17-19
Organization of health services delivery, and inadequate CHWs' working conditions		High cost of services	15,18,19
		Long distance to health facility	9,18,19
		Poor quality of services	9
		Shortage of drugs	9,15
	Unsuitable CHWs working conditions	Lack of transportation means for CHWs	17-19
		CHWs' low remuneration	18,19
Lack of trust in CHWs	Scepticism in CHWs competence; CHWs' lack of specialized training; CHWs' need for support	Perceived lack of CHWs' competence; mistrust in CHWs; CHWs low literacy level;	17-19
		Need for clear community's understanding of CHWs' role	CHWs not being accepted by the community.
		not meeting women's needs;	17

Abbreviations: ANC, antenatal clinic. CHWs, community health workers. SP, sulfadoxine-pyrimethamine. PW, pregnant women.

Data from both Okedo-Alex 2020<sup>20</sup> and Okedo-Alex 2022 were combined.<sup>16</sup> Data from both Enguita-Fernandez 2020<sup>19</sup> and Alonso 2022 were combined.<sup>18</sup>

Supplementary Table 11: Themes related to facilitators of community IPTp delivery

Main themes	Secondary themes	Primary themes	References
CHW traits and trust	Women's trust in CHWs; kinship structures	CHWs known, chosen by the community	9,15,16
		Ability of CHWs to convince husbands	15
	CHWs ability to convince husbands through explanation of the strategy; encouragement of women	CHWs reminding women of the next dose	9
		CHWs being kind, approachable, and understanding	15,18,19
		CHWs' gender equity (existence of male and female)	17
	commitment to their work; task simplicity	CHWs' feeling capable	9,17
CHWs' role in improving health of the community		9,17	
CHW capabilities and their role in linking the community with health facilities	Linking CHWs to health units; integration of c-IPTp in health systems; bridging community to health systems.	Pre-existing CHWs	9,15,18,19
		Training and regular supervision of CHWs	15,17-19
		Linking community to health facilities	15,17-19
		community-clinic partnership	17
CHW accessibility	Easy accessibility of CHWs and their ability to conduct home visits	Home visits; CHWs being accessible	9,15
		No walking long distance	9
Community sensitization and engagement	Community engagement Sustainability of the approach	Community sensitization	15,17-19
		Mass media campaigns	15,17-19
		Use of local council meetings, drama groups, Seminars targeting men Women encouraging other women	15
		Community involvement	9,16-19
		Community support	17
		Local authorities' involvement	18,19
Women's knowledge on malaria and positive view of SP and c-IPTp and perceived benefits	Knowledge of malaria; awareness of the benefits of malaria prevention in pregnancy	Previous experience with malaria and symptoms	15
		Knowledges of malaria consequences	9,15,16
		Previous use of IPTp-SP; improved health with first dose	15,18,19
		Medical pluralism	18,19
	Benefits to the community	Desire to produce a healthy baby	15
	Positive view of SP	Positive view of SP; perceived quality of SP	9,15-19
	Positive perception of c-IPTp	Positive view of c-IPTp	9,16
Support from husband and relatives		Husband's support; support from relatives	21

Abbreviations: CHWs, community health workers. IPTp-SP, intermittent preventive treatment of malaria in pregnancy with sulfadoxine-pyrimethamine. cIPTp, community delivery of IPTp

Data from both Okedo-Alex 2020<sup>20</sup> and Okedo-Alex 2022 were combined.<sup>16</sup> Data from both Enguita-Fernandez 2020<sup>19</sup> and Alonso 2022 were combined.<sup>18</sup>

Supplementary Table 12: Lists of records excluded and reasons for exclusion

References	Reasons for exclusion
Adjei DJD. Factors affecting the intermittent preventive therapy of malaria in pregnancy programme in the Ejisu-Juabeng municipality [Internet] [Thesis]. 2009. Available from: <a href="http://dspace.knust.edu.gh:8080/jspui/bitstream/123456789/67/1/INTRODUCTION.Addison%203%20orig.pdf">http://dspace.knust.edu.gh:8080/jspui/bitstream/123456789/67/1/INTRODUCTION.Addison%203%20orig.pdf</a>	Not community intervention of IPTp meeting eligibility criteria
Afolabi BM, Okoh F, Fatunmbi S, Komakech W, Sallu O, Ewoigbokhan F, et al. Combined intervention of intermittent preventive therapy and long-lasting insecticide treated nets among pregnant women in Nigeria [Internet]. Vol. 3, Journal of Public health and Epidemiology. 2011. p. 608–16. Available from: <a href="http://www.heendef.org.ng/Document/Afolabi%20et%20a_l_published.pdf">http://www.heendef.org.ng/Document/Afolabi%20et%20a_l_published.pdf</a>	Not community intervention of IPTp meeting eligibility criteria
Agyare CS. Evaluating the implementation of intermittent preventive treatment (IPTp) programme using sulphadoxine pyrimethamine for the control of malaria in pregnancy in the Kwabre District of Ghana [Internet] [Thesis]. 2008. Available from: <a href="http://dspace.knust.edu.gh:8080/jspui/bitstream/123456789/72/1/PART%20-%203.pdf">http://dspace.knust.edu.gh:8080/jspui/bitstream/123456789/72/1/PART%20-%203.pdf</a>	Not community intervention of IPTp meeting eligibility criteria
Anoke C, Orji B, Bryce E, Oliveras E, Enne J, Njoku E, et al. Comparative analysis of facility and community distribution of intermittent preventive treatment of malaria in pregnancy: Evidence from maternity record booklet in Ohaukwu, Ebonyi State Nigeria. In American Journal of Tropical Medicine and Hygiene; 2022. p. 121. Available from: <a href="https://www.astmh.org/getmedia/65cc0d8d-1208-4d9a-9f77-734d40de4c02/ASTMH-2022-Annual-Meeting-Abstract-Book.pdf">https://www.astmh.org/getmedia/65cc0d8d-1208-4d9a-9f77-734d40de4c02/ASTMH-2022-Annual-Meeting-Abstract-Book.pdf</a>	Conference abstract, insufficient details
Antimalarial drugs: costs, safety, and efficacy. Hauppauge, NY : Nova Science, c2009.; 2009.	Not community intervention of IPTp meeting eligibility criteria
Apat, D., Akhwale, W., Kidi, M., et al. Increasing access to malaria in pregnancy services through community health units and enhanced supportive supervision of community health volunteers [Internet]. Vol. 103, American Journal of Tropical Medicine and Hygiene. p. 123.	Conference abstract, insufficient details
Badolo, O., Tiendrebeogo, J., Sawadogo, Y., et al. Scale up of intermittent preventive treatment of malaria in pregnancy (IPTp) by community health workers following the results of a feasibility pilot in Po District, Burkina Faso [Internet]. Available from: <a href="http://app.core-apps.com/tristar_astmh21/abstract/b7438cf1-19e4-4f13-a4fc-452eea1120ec">http://app.core-apps.com/tristar_astmh21/abstract/b7438cf1-19e4-4f13-a4fc-452eea1120ec</a>	Data captured in the review from other publications
Beyai P. The cost-effectiveness of intermittent preventive treatment for malaria in Gambian multigravidae including examination of indirect costs [Internet] [Thesis]. 2010. Available from: <a href="http://ethos.bl.uk/OrderDetails.do?did=6&amp;uin=uk.bl.ethos.504541">http://ethos.bl.uk/OrderDetails.do?did=6&amp;uin=uk.bl.ethos.504541</a>	Not community intervention of IPTp meeting eligibility criteria
Bigirwa P. Effectiveness of community health workers (CHWS) in the provision of basic preventive and curative maternal, newborn and child health (MNCH) interventions: a systematic review [Internet]. Vol. 7, Health Policy and Development. 2009. p. 162–72. Available from: <a href="http://www.bioline.org.br/pdf?hp09013">http://www.bioline.org.br/pdf?hp09013</a>	Review, not an original research study
Brieger, R. W, Burke, D., Tiendrebeogo, J., et al. Feasibility study on intermittent preventive treatment of malaria in pregnancy at the community level in Burkina Faso; Implementation research for testing new approaches to improving prevention of malaria in pregnancy [Internet]. 2020 Mar. Available from: <a href="https://endmalaria.org/sites/default/files/Burkina%20Faso%20C-IPTp%20Study%20Report%20FINAL.pdf">https://endmalaria.org/sites/default/files/Burkina%20Faso%20C-IPTp%20Study%20Report%20FINAL.pdf</a>	Data captured in the review from other publications
Brieger, W.R., Dodo, M., Burke, D., et al. Community based health workers can enhance coverage of intermittent preventive treatment of malaria in pregnancy and promote antenatal attendance [Internet]. Available from: <a href="http://www.abstractsonline.com/pp8/#!/4692/presentation/19636">www.abstractsonline.com/pp8/#!/4692/presentation/19636</a>	Data captured in the review from other publications
Chinkhumba, J., Rubenstein, L. B, Chillima, E., et al. Impact of community delivery on coverage of intermittent preventive treatment for malaria in pregnancy in Malawi [Internet]. Available from: <a href="http://app.core-apps.com/tristar_astmh21/abstract/569e6a11-b01b-40c9-8383-d6d4d6bf5e0f">http://app.core-apps.com/tristar_astmh21/abstract/569e6a11-b01b-40c9-8383-d6d4d6bf5e0f</a>	Conference abstract, insufficient details
Ciapponi A, Lewin S, Herrera CA, Opiyo N, Pantoja T, Paulsen E, et al. Delivery arrangements for health systems in low-income countries: an overview of systematic reviews [Internet]. Cochrane Database of Systematic Reviews. 2017. Available from: <a href="http://dx.doi.org/10.1002/14651858.CD011083.pub2">http://dx.doi.org/10.1002/14651858.CD011083.pub2</a>	Did not report on the outcomes of interest (IPTp and ANC).
Denakpo B, Togbenou J, Dagnon JF, Amegnikou DE, Amoussou SI, Hounkpe B, et al. Assessment of behavior change communication (BCC) interventions in support of malaria control activities conducted in Benin by pmi's ARM3 project [Internet]. Vol. 97, American journal of tropical medicine and hygiene. Conference: 66th annual meeting of the american society of tropical medicine and hygiene, ASTMH 2017. United states. 2017. p. 335.	Conference abstract, insufficient details

Deogratias, N. C, Ketembwe, F., Ekandji, J., et al. The contribution of community delivery to the uptake of intermittent preventive treatment of malaria in pregnancy with sulfadoxine-pyrimethamine in three districts of the Democratic Republic of the Congo [Internet]. Available from: <a href="http://app.core-apps.com/tristar_astmh21/abstract/cd43c5c6-76eb-4828-a62d-be808994ea6d">http://app.core-apps.com/tristar_astmh21/abstract/cd43c5c6-76eb-4828-a62d-be808994ea6d</a>	Conference abstract, insufficient details
Diala C, Pennas T, Choi P, Rogers S. Barriers to uptake of malaria prevention and treatment during pregnancy in Cross River and Nasawara States, Nigeria [Internet]. 2012 Jan. Available from: <a href="http://www.changeprogram.org/sites/default/files/Barriers-to-Uptake-of-Malaria-Prevention-and-Treatment.pdf">http://www.changeprogram.org/sites/default/files/Barriers-to-Uptake-of-Malaria-Prevention-and-Treatment.pdf</a>	Not community intervention of IPTp meeting eligibility criteria
Duong M, Swadogo Y, Guimas JL, Yonli C, Moyenga I, Grimaldi M, et al. Assessing information, education and behavior change intervention in a malaria control program implemented in Ouahigouya district, Burkina Faso [Internet]. Vol. 16, Tropical Medicine and International Health. p. 147–147.	Conference abstract, insufficient details
E.O. T, Lawson B, Browne E. The effectiveness and perception of the use of sulphadoxine-pyrimethamine in intermittent preventive treatment of malaria in pregnancy programme in Offinso District of Ashanti Region, Ghana [Internet]. Vol. 10, Malaria Journal. 2011. p. 385 PMID 22206597. Available from: <a href="http://www.malariajournal.com/content/pdf/1475-2875-10-385.pdf">http://www.malariajournal.com/content/pdf/1475-2875-10-385.pdf</a>	Not community intervention of IPTp meeting eligibility criteria
Ghana M of H. Accelerating Access to Prevention and Treatment of Malaria through Scaling-Up of Home-Based Care and Indoor Residual Spraying Towards the Achievement of the National Strategic Goal. Ghana Global Fund Proposal Round 8 [Internet]. 2008 Jan. Available from: <a href="http://www.theglobalfund.org/grantdocuments/8GHNM_1678_0_full.pdf">http://www.theglobalfund.org/grantdocuments/8GHNM_1678_0_full.pdf</a>	Limited details, not sufficient data to include
Ghansah G. Factors promoting and preventing the utilization and uptake of IPT among pregnant women in the Mampong Municipality, Ghana [Internet] [Thesis]. 2016. Available from: <a href="http://hdl.handle.net/123456789/9122">http://hdl.handle.net/123456789/9122</a>	Not community intervention of IPTp meeting eligibility criteria
Gonzalez R, Sacooc C, Arikpo I, Mbombo Ndombe D, Ramananjato R, Llach M, et al. Effect of community delivery of intermittent preventive treatment (IPTp) of malaria in pregnancy on coverage of IPTp in four sub-Saharan African Countries. In American Journal of Tropical Medicine and Hygiene; 2022. p. 552. Available from: <a href="https://www.astmh.org/getmedia/65cc0d8d-1208-4d9a-9f77-734d40de4c02/ASTMH-2022-Annual-Meeting-Abstract-Book.pdf">https://www.astmh.org/getmedia/65cc0d8d-1208-4d9a-9f77-734d40de4c02/ASTMH-2022-Annual-Meeting-Abstract-Book.pdf</a>	Data captured in the review from other publications
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Pell CL. Community responses to malaria: interventions in sub-Saharan Africa [Internet] [Thesis]. 2014. Available from: <a href="http://dare.uva.nl/record/470959">http://dare.uva.nl/record/470959</a>	Not community intervention of IPTp meeting eligibility criteria
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Roman E, Rawlins B, Gomez P, Dineen R, Dickerson A, Brieger B. Scaling up malaria in pregnancy programs: what it takes. The JHPIEGO experience [Internet]. 2008 Jan. Available from: <a href="http://www.jhpiego.org/resources/pubs/spJhp2008malaria.pdf">http://www.jhpiego.org/resources/pubs/spJhp2008malaria.pdf</a>	Not community intervention of IPTp meeting eligibility criteria
Ruizendaal E, Schallig H, Scott S, Traore-Coulibaly M, Bradley J, Lompo P, et al. Evaluation of Malaria Screening during Pregnancy with Rapid Diagnostic Tests Performed by Community Health Workers in Burkina Faso. Vol. 97, Am J Trop Med Hyg. 2017. p. 1190–7.	Data captured in the review from other publications
Ruizendaal E, Schallig H, Traore M, Lompo P, Magloire NH, Traore O, et al. Malaria screening during pregnancy with RDTs performed by community health workers in Nanoro, Burkina Faso [Internet]. Vol. 22, Tropical medicine & international health. 2017. p. 96-. Available from: <a href="https://www.cochranelibrary.com/central/doi/10.1002/central/CN-01419317/full">https://www.cochranelibrary.com/central/doi/10.1002/central/CN-01419317/full</a>	Limited details, not sufficient data to include
Ruizendaal E. Malaria in pregnancy: in search of tools for improved prevention (2017) [Internet] [Thesis]. 2017. Available from: <a href="http://hdl.handle.net/11245.1/bee2681b-939e-4c3a-a751-991ceea6af5c">http://hdl.handle.net/11245.1/bee2681b-939e-4c3a-a751-991ceea6af5c</a>	Data captured in the review from other publications
Sall, B. F, Diaw, S, FB, Gaye, S., et al. Implementation community-based delivery of intermittent preventive treatment in pregnancy (IPTp) with sulfadoxine pyrimethamine in 2020 in the context of the COVID 19 pandemic in Senegal [Internet]. Available from: <a href="http://app.core-apps.com/tristar_astmh21/abstract/b53ab7b0-3617-4dbf-8006-78193116a74b">http://app.core-apps.com/tristar_astmh21/abstract/b53ab7b0-3617-4dbf-8006-78193116a74b</a>	Conference abstract, insufficient details
Schallig H, Ruizendaal E, Traore M, Lompo P, Magloire N, Bradley J, et al. Screening for malaria in pregnancy with rdts by community health workers in nanoro, burkina faso [Internet]. Vol. 97, American journal of tropical medicine and hygiene. 2017. p. 93-. Available from: <a href="https://www.cochranelibrary.com/central/doi/10.1002/central/CN-01462157/full">https://www.cochranelibrary.com/central/doi/10.1002/central/CN-01462157/full</a>	Did not report on the outcomes of interest (IPTp and ANC).
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Sirima SB, Cotte AH, Konate A, Moran AC, Asamoa K, Bougouma EC, et al. Malaria prevention during pregnancy: assessing the disease burden one year after implementing a program of intermittent preventive treatment in Koupela District, Burkina Faso [Internet]. Vol. 75, American Journal of Tropical Medicine and Hygiene. 2006. p. 205-211 PMID 16896120. Available from: <a href="http://www.ajtmh.org/cgi/content/full/75/2/205">http://www.ajtmh.org/cgi/content/full/75/2/205</a>	Not community intervention of IPTp meeting eligibility criteria
Solo, R. E, Andriantsitohaina, N. F, Andriarinirina, N. F, et al. Expanding intermittent preventive treatment of malaria in pregnancy (IPTp) through community distribution also increased IPTp uptake through antenatal care visits in three districts of Madagascar [Internet]. Available from: <a href="http://app.core-apps.com/tristar_astmh21/abstract/84ead92e-ed71-4b7d-aca8-292f31ba52e1">http://app.core-apps.com/tristar_astmh21/abstract/84ead92e-ed71-4b7d-aca8-292f31ba52e1</a>	Conference abstract, insufficient details



Sunguya BF, Mlunde LB, Ayer R, Jimba M. Towards eliminating malaria in high endemic countries: the roles of community health workers and related cadres and their challenges in integrated community case management for malaria: a systematic review [Internet]. Vol. 16, Malaria Journal. 2017. p. 10 PMID PM:28049486. Available from: <a href="https://malariajournal.biomedcentral.com/articles/10.1186/s12936-016-1667-x">https://malariajournal.biomedcentral.com/articles/10.1186/s12936-016-1667-x</a>	Review, not an original research study
Tanoh, M. A, Yah, K. C, Agnon, J., et al. Outreach ANC in Côte d'Ivoire leads to improvements in the coverage of IPTp3 in pregnant women [Internet]. Available from: <a href="http://app.core-apps.com/tristar_astmh21/abstract/fc272419-0d8a-47cf-98c5-e0ecb1d9ed37">http://app.core-apps.com/tristar_astmh21/abstract/fc272419-0d8a-47cf-98c5-e0ecb1d9ed37</a>	Used mobile nurses instead of community health workers
Tiendrebeogo J, Badolo O, Dodo M, Burke D, Brieger W. Contribution of community-based health workers (CBHWS) to improving prevention of malaria in pregnancy: process for implementing a feasibility study [Internet]. Available from: <a href="http://www.astmh.org/annual-meeting/2017-abstract-book-and-final-program">http://www.astmh.org/annual-meeting/2017-abstract-book-and-final-program</a>	Conference abstract, insufficient details
Tiendrebeogo, J., Badolo, O., Dodo, M., et al. Acceptance of the contribution of community-based health workers (CHBWs) to improving prevention of malaria in pregnancy in Burkina Faso by Health Center Staff [Internet]. Tropical Health Matters. 2018. Available from: <a href="http://maliarmatters.org/acceptance-of-the-contribution-of-community-based-health-workers-cbhws-to-improving-prevention-of-malaria-in-pregnancy-in-burkina-faso-by-health-center-staff/">http://maliarmatters.org/acceptance-of-the-contribution-of-community-based-health-workers-cbhws-to-improving-prevention-of-malaria-in-pregnancy-in-burkina-faso-by-health-center-staff/</a>	Conference abstract, insufficient details
TIPTOP. Delivery of community intermittent preventive treatment in pregnancy in the context of COVID-19 [Internet]. 2020. Available from: <a href="https://www.tiptopmalaria.org/wp-content/uploads/2020/04/TIPTOPCOVID-19-Guidelines-Final.pdf">https://www.tiptopmalaria.org/wp-content/uploads/2020/04/TIPTOPCOVID-19-Guidelines-Final.pdf</a>	Limited details, not sufficient data to include
White MT, Conteh L, Cibulskis R, Ghani AC. Costs and cost-effectiveness of malaria control interventions - a systematic review [Internet]. Vol. 10, Malaria Journal. 2011. p. 337 PMID 22050911. Available from: <a href="http://www.malariajournal.com/content/10/1/337">http://www.malariajournal.com/content/10/1/337</a>	Review, not an original research study
Wiseman V, Kim M, Mutabingwa TK, Whitty CJ. Cost-Effectiveness Study of Three Antimalarial Drug Combinations in Tanzania [Internet]. Vol. 3, PLoS medicine. 2006. Available from: <a href="https://www.cochranelibrary.com/central/doi/10.1002/central/CN-00677442/full">https://www.cochranelibrary.com/central/doi/10.1002/central/CN-00677442/full</a>	Not community intervention of IPTp meeting eligibility criteria
Wolf, K., Alao, M., Onikpo, F., et al. Malaria in pregnancy and antenatal care knowledge, attitudes and intervention coverage in Atlantique Department, Benin [Internet]. Available from: <a href="http://app.core-apps.com/tristar_astmh21/abstract/530281f8-f791-4526-b4f4-19e011040ae5">http://app.core-apps.com/tristar_astmh21/abstract/530281f8-f791-4526-b4f4-19e011040ae5</a>	Conference abstract, insufficient details
Wolf, K., Oseni, L., Gomez, P., et al. Understanding malaria in pregnancy service delivery quality in 7 African countries [Internet]. Available from: <a href="http://app.core-apps.com/tristar_astmh21/abstract/08a27ea9-1d46-4aaa-8948-559e560fa0b8">http://app.core-apps.com/tristar_astmh21/abstract/08a27ea9-1d46-4aaa-8948-559e560fa0b8</a>	Conference abstract, insufficient details
Wolfe EB, Parise ME, Haddix AC, Nahlen BL, Ayisi J, Misore A, et al. Cost-effectiveness of sulfadoxine-pyrimethamine for the prevention of malaria-associated low birth weight [Internet]. Vol. 64, American Journal of Tropical Medicine and Hygiene. 2001. p. 178-186 PMID 11442215. Available from: <a href="http://www.ajtmh.org/cgi/reprint/64/3/178">http://www.ajtmh.org/cgi/reprint/64/3/178</a>	Modeling cost analysis

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