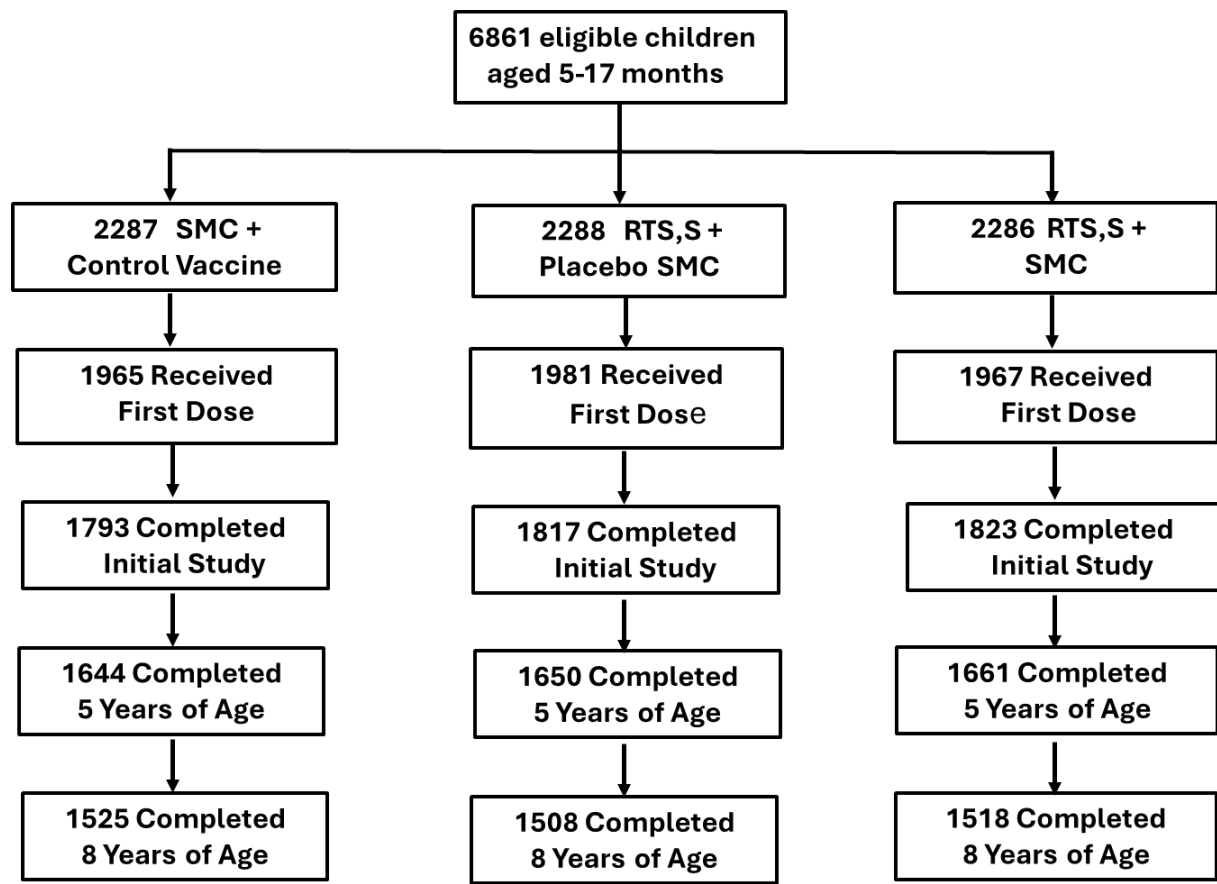


Table 1: Consort chart



**Table 2.** Baseline characteristics of children in the three intervention groups for both countries combined at the time of enrolment.

	SMC alone		RTS,S <sup>1</sup> alone		Combined		Total	
<b>Total number of children</b>	1965		1988		1967		5920	
<b>Age at first vaccination</b>	No.	%	No.	%	No.	%	No.	%
Under 8 months	471	24	448	22.5	463	23.5	1382	23.3
8-11 months	532	27.1	527	26.5	531	27	1590	26.9
12-15 months	486	24.7	552	27.8	537	27.3	1575	26.6
16 months or older	476	24.2	461	23.2	436	22.2	1373	23.2
<b>Sex</b>								
Male	1015	51.7	1032	51.9	1019	51.8	3066	51.8
Female	950	48.3	956	48.1	948	48.2	2854	48.2
<b>LLIN<sup>2</sup> use the night before the 2017 census</b>								
Yes	1593	81.6	1580	80.2	1577	80.6	4750	80.8
No	360	18.4	391	19.8	380	19.4	1131	19.2
Missing	12		17		10		39	
<b>PCV<sup>3</sup> vaccination</b>								
Yes	1650	84	1646	82.8	1642	83.5	4938	83.4
No	82	4.2	99	5	74	3.8	255	4.3
Card not available	172	8.8	175	8.8	171	8.7	518	8.8
Card available but incomplete	61	3.1	67	3.4	79	4	207	3.5
Missing	0		1		1		2	
<b>Penta<sup>4</sup> vaccination</b>								
Yes	1650	84	1647	82.9	1650	84.1	4947	83.7
No	87	4.4	95	4.8	78	4	260	4.4
Card not available	169	8.6	179	9	167	8.5	515	8.7
Card available but incomplete	58	3	66	3.3	67	3.4	191	3.2
Missing	1		1		5		7	
<b>MenAfriVac<sup>5</sup> vaccination</b>								
Yes	468	27.3	477	27.6	478	27.6	1423	27.5
No	1245	72.7	1251	72.4	1251	72.4	3747	72.5
Missing	252		260		238		750	

<sup>1</sup> RTS,S - RTS,S/AS01E, <sup>2</sup> LLIN – Long-lasting Insecticide Treated Net, <sup>3</sup>PCV – 11 valent pneumococcal conjugate vaccine, <sup>4</sup>Penta – tetanus, diphtheria, hepatitis B and *Hemophilus influenzae* type b conjugate vaccine, <sup>5</sup>MenAfriVac – group A meningococcal conjugate vaccine.

**Table 3.** Incidence of uncomplicated clinical episodes of malaria in the intervention, post-intervention and combined periods in children in the younger age cohort in Burkina Fas

Variable	Person-years at risk	Events no.	Incidence (95% CI) no. of events/1000 person-yr at risk	Protective Efficacy (95% CI) for vaccine alone or vaccine combined with SMC vs. SMC alone	Protective Efficacy (95% CI) for the combination of vaccine and SMC vs vaccine alone
<b>Combined intervention and post intervention years</b>					
Chemoprevention alone	2724.3	1456	534.5 (507.4 to 562.6)	Reference	
Vaccine alone	2627.4	1316	500.9 (474.2 to 528.7)	6.8 (-5.2 to 17.5)	Reference
Combination	2736.2	1123	410.4 (386.8 to 435.2)	23.4 (12.7 to 32.8)	17.9 (6.3 to 28)
<b>Intervention period</b>					
Chemoprevention alone	1798.7	687	381.9 (353.9 to 411.6)	Reference	
Vaccine alone	1744.3	739	423.7 (393.7 to 455.4)	-11.2 (-28.2 to 3.6)	Reference
Combination	1820	315	173.1 (154.5 to 193.3)	55.0 (46.1 to 62.4)	59.8 (51.9 to 66.4)
<b>Post intervention period years 1-3 combined</b>					
Chemoprevention alone	925.5	769	830.9 (773.2 to 891.7)	Reference	
Vaccine alone	883.1	577	653.4 (601.1 to 708.9)	22.0 (8.0 to 33.9)	Reference
Combination	916.1	808	882 (822.2 to 944.9)	-6.5 (-25.1 to 9.2)	-37.1 (-61.0 to -16.7)
<b>Post intervention period Year 1</b>					
Chemoprevention alone	346.0	286	826.5 (733.5 to 928)	Reference	
Vaccine alone	332.8	194	582.9 (503.8 to 671)	28.8 (12.7 to 41.9)	Reference
Combination	347.3	298	858 (763.3 to 961.1)	-3.4 (-26.0 to 15.1)	-45.8 (-79.3 to -18.6)
<b>Post intervention period Year 2</b>					
Chemoprevention alone	334.7	253	756 (665.7 to 855.1)	Reference	
Vaccine alone	318.1	199	625.6 (541.7 to 718.8)	17.7 (-3.0 to 34.2)	Reference
Combination	328.4	261	794.8 (701.3 to 897.3)	-5.4 (-29.5 to 14.2)	-28.8 (-59.9 to -3.8)

<b>Post intervention period Year 3</b>					
Chemoprevention alone	244.8	230	939.5 (822 to 1069.1)	Reference	
Vaccine alone	232.2	184	792.4 (682 to 915.5)	17.9 (-5 to 35.7)	Reference
Combination	240.4	249	1035.7 (911 to 1172.6)	-12 (-41.1 to 11.1)	-36.4 (-73.7 to -7)

**Table 4.** Incidence of uncomplicated clinical episodes of malaria in the intervention, post-intervention and combined periods in children in the younger age cohort in Mali.

Variable	Person-years at risk	Events no.	Incidence (95% CI) no. of events/1000 person-yr at risk	Protective Efficacy (95% CI) for vaccine alone or vaccine combined with SMC vs. SMC alone	Protective Efficacy (95% CI) for the combination of vaccine and SMC vs vaccine alone
<b>Combined intervention and post intervention Years</b>					
Chemoprevention alone	3068.4	1014	330.5 (310.4 to 351.4)	Reference	
Vaccine alone	2785.8	743	266.7 (247.9 to 286.6)	19.5 (-0.1 to 35.3)	Reference
Combination	2873.4	590	205.3 (189.1 to 222.6)	38.4 (23.6 to 50.3)	23.5 (4.3 to 38.9)
<b>Intervention period</b>					
Chemoprevention alone	2061.5	495	240.1 (219.4 to 262.2)	Reference	
Vaccine alone	1896.9	429	226.2 (205.3 to 248.6)	5.5 (-20.8 to 26.1)	Reference
Combination	1951.6	185	94.8 (81.6 to 109.5)	61 (49.5 to 69.9)	58.7 (45.9 to 68.4)
<b>Post intervention period years 1-3 combined</b>					
Chemoprevention alone	1007	519	515.4 (472 to 561.7)	Reference	
Vaccine alone	888.9	314	353.2 (315.2 to 394.5)	32 (13.7 to 46.4)	Reference
Combination	921.7	405	439.4 (397.6 to 484.3)	15.1 (-6.9 to 32.6)	-24.9 (-59.9 to 2.4)
<b>Post intervention period Year 1</b>					
Chemoprevention alone	370.7	251	677.1 (595.9 to 766.2)	Reference	
Vaccine alone	328.8	155	471.3 (400.1 to 551.7)	30.4 (10.1 to 46.1)	Reference
Combination	341.3	189	553.8 (477.6 to 638.6)	18.4 (-4.9 to 36.5)	-17.7 (-53.8 to 10)
<b>Post intervention period Year 2</b>					

Chemoprevention alone	365.3	146	399.6 (337.4 to 470)	Reference	
Vaccine alone	322.2	88	273.1 (219.1 to 336.5)	32 (6.7 to 50.5)	Reference
Combination	334.8	111	331.5 (272.7 to 399.2)	17.3 (-13.5 to 39.8)	-21.7 (-70 to 12.9)
<b>Post intervention period Year 3</b>					
Chemoprevention alone	270.9	122	450.4 (374.0 to 537.7)	Reference	
Vaccine alone	237.9	71	298.4 (233.1 to 376.5)	35.5 (7.7 to 55)	Reference
Combination	245.6	105	427.5 (349.7 to 517.6)	5.5 (-32.8 to 32.7)	-46.6 (-113.3 to -0.8)

**Table 5.** Incidence of uncomplicated clinical episodes of malaria in the intervention, post-intervention and periods in children in the older age cohort in Burkina Faso.

Variable	Person-years at risk	Events no.	Incidence (95% CI) no. of events/1000 person-yr at risk	Protective Efficacy (95% CI) for vaccine alone or vaccine combined with SMC vs. SMC alone	Protective Efficacy (95% CI) for the combination of vaccine and SMC vs vaccine alone
<b>Combined intervention and post intervention Years</b>					
Chemoprevention alone	3392.9	1690	498.1 (474.6 to 522.4)	Reference	
Vaccine alone	3351.8	1626	485.1 (461.8 to 509.3)	3 (-7.8 to 12.7)	Reference
Combination	3395.1	1213	357.3 (337.4 to 378)	28.6 (20.2 to 36)	26.4 (17.7 to 34.1)
<b>Intervention period</b>					
Chemoprevention alone	2008.1	816	406.4 (379.0 to 435.2)	Reference	
Vaccine alone	1984.3	882	444.5 (415.6 to 474.8)	-9.9 (-24.5 to 2.9)	Reference
Combination	1991.5	358	179.8 (161.6 to 199.4)	56.5 (49.4 to 62.6)	60.5 (54.1 to 66.1)
<b>Post intervention period years 1-3 combined</b>					
Chemoprevention alone	1384.8	874	631.2 (590.0 to 674.4)	Reference	
Vaccine alone	1367.5	744	544.0 (505.7 to 584.6)	14.1 (0.6 to 25.8)	Reference
Combination	1403.6	855	609.1 (569 .0to 651.4)	3.3 (-11 to 15.7)	-12.7 (-29.8 to 2.1)
<b>Post intervention period Year 1</b>					
Chemoprevention alone	480.1	286	595.7 (528.7 to 668.9)	Reference	
Vaccine alone	472.3	220	465.8 (406.3 to 531.6)	22.3 (5.5 to 36.1)	Reference
Combination	482.2	263	545.5 (481.5 to 615.5)	8.6 (-10.7 to 24.6)	-17.6 (-43.4 to 3.5)
<b>Post intervention period Year 2</b>					

Chemoprevention alone	463	333	719.2 (644.0 to 800.7)	Reference	
Vaccine alone	459.9	283	615.3 (545.7 to 691.4)	14.8 (-2.8 to 29.3)	Reference
Combination	470.5	300	637.7 (567.6 to 714.1)	11.4 (-6.4 to 26.2)	-4 (-25.5 to 13.9)
<b>Post intervention period Year 3</b>					
Chemoprevention alone	441.7	255	577.4 (508.7 to 652.8)	Reference	
Vaccine alone	435.3	241	553.7 (486.0 to 628.1)	4.5 (-18.8 to 23.2)	Reference
Combination	451	292	647.4 (575.3 to 726.1)	-12.7 (-38 to 8)	-18 (-45 to 3.9)

**Table 6.** Incidence of uncomplicated clinical episodes of malaria in the intervention, post-intervention and periods in children in the older age in Mali.

Variable	Person-years at risk	Events no.	Incidence (95% CI) no. of events/1000 person-yr at risk	Protective Efficacy (95% CI) for vaccine alone or vaccine combined with SMC vs. SMC alone	Protective Efficacy (95% CI) for the combination of vaccine and SMC vs vaccine alone
<b>Combined intervention and post intervention Years</b>					
Chemoprevention alone	3245.1	1307	402.8 (381.2 to 425.2)	Reference	
Vaccine alone	3697.4	1143	309.1 (291.5 to 327.6)	23.4 (10.6 to 34.3)	Reference
Combination	3464.4	805	232.4 (216.6 to 249.0)	42.7 (31.6 to 51.9)	25.2 (10.9 to 37.3)
<b>Intervention period</b>					
Chemoprevention alone	1960.8	491	250.4 (228.8 to 273.6)	Reference	
Vaccine alone	2236.9	476	212.8 (194.1 to 232.8)	14.7 (-4.7 to 30.5)	Reference
Combination	2079.4	191	91.9 ( 79.3 to 105.8)	63.7 (53 to 71.9)	57.4 (44.9 to 67.1)
<b>Post intervention period years 1-3 combined</b>					
Chemoprevention alone	1284.4	816	635.3 (592.5 to 680.5)	Reference	
Vaccine alone	1460.5	667	456.7 (422.7 to 492.7)	28.1 (15.6 to 38.7)	Reference
Combination	1385.0	614	443.3 (408.9 to 479.8)	30.3 (16.7 to 41.7)	3.2 (-15.6 to 18.9)
<b>Post intervention period Year 1</b>					
Chemoprevention alone	436.6	316	723.7 (646.1 to 808.1)	Reference	
Vaccine alone	501.6	206	410.7 (356.5 to 470.8)	43.6 (30.8 to 54.1)	Reference
Combination	473.0	217	458.7 (399.7 to 524)	36.9 (21.1 to 49.5)	-12.2 (-41.1 to 10.9)

<b>Post intervention period Year 2</b>					
Chemoprevention alone	425.7	318	746.9 (667.1 to 833.7)	Reference	
Vaccine alone	484.8	284	585.9 (519.7 to 658.1)	21.8 (5 to 35.6)	Reference
Combination	460.4	255	553.9 (488.0 to 626.2)	26.2 (9 to 40.2)	5.9 (-16.1 to 23.7)
<b>Post intervention period Year 3</b>					
Chemoprevention alone	422	182	431.3 (370.9 to 498.7)	Reference	
Vaccine alone	474.1	177	373.3 (320.3 to 432.5)	13.9 (-11 to 33.1)	Reference
Combination	451.6	142	314.4 (264.8 to 370.6)	28.1 (5.4 to 45.4)	16.6 (-8.8 to 36.1)

**Table 7.** Deaths from all causes, deaths excluding trauma and deaths from malaria during combined intervention and post intervention periods and intervention and post intervention periods separately in children in the younger age cohort.

Variable	Person-yr at Risk	Events no.	Incidence (95% CI) no. of events/1000 person-yr at risk	Protective Efficacy, Vaccine Alone or Combination vs. Chemoprevention (95% CI)	Protective Efficacy, Combination vs. Vaccine Alone (95% CI)
<b>Deaths (all causes)</b>					
<b>Combined intervention and post intervention Years</b>					
Chemoprevention alone	4596.9	18	3.9 (2.3 to 6.2)	Reference	
Vaccine alone	4315.7	18	4.2 (2.5 to 6.6)	-5.3 (-103.1 to 45.4)	Reference
Combination	4472.8	9	2 (0.9 to 3.8)	49.3 (-12.9 to 77.2)	51.8 (-7.1 to 78.3)
<b>Intervention period</b>					
Chemoprevention alone	3874.1	17	4.4 (2.6 to 7)	Reference	
Vaccine alone	3651.0	17	4.7 (2.7 to 7.5)	-5.1 (-106.6 to 46.5)	Reference
Combination	3780.1	7	1.9 (0.7 to 3.8)	58.3 (-0.8 to 82.7)	60.3 (4.2 to 83.5)
<b>Post intervention period years 1-3 combined</b>					
Chemoprevention alone	722.8	1	1.4 (0 to 7.7)	Reference	
Vaccine alone	664.7	1	1.5 (0 to 8.4)	-	Reference
Combination	692.7	2	2.9 (0.3 to 10.4)	-	-
<b>Deaths (excluding external causes and surgery)</b>					
<b>Combined intervention and post intervention Years</b>					
Chemoprevention alone	4596.9	13	2.8 (1.5 to 4.8)	Reference	
Vaccine alone	4315.7	14	3.2 (1.8 to 5.4)	-13.4 (-141.9 to 46.9)	Reference

<b>Combination</b>	4472.8	7	1.6 (0.6 to 3.2)	45.4 (-36.6 to 78.2)	51.9 (-19 to 80.5)
<b>Intervention period</b>					
<b>Chemoprevention alone</b>	3874.1	13	3.4 (1.8 to 5.7)	Reference	
<b>Vaccine alone</b>	3651.0	13	3.6 (1.9 to 6.1)	-5.1 (-127.4 to 51.4)	Reference
<b>Combination</b>	3780.1	5	1.3 (0.4 to 3.1)	61 (-9.3 to 86.1)	62.9 (-4 to 86.8)
<b>Post intervention period years 1-3 combined, both countries</b>					
<b>Chemoprevention alone</b>	722.8	0	0 (0 to 5.1)	Reference	
<b>Vaccine alone</b>	664.7	1	1.5 (0 to 8.4)	-	Reference
<b>Combination</b>	692.7	2	2.9 (0.3 to 10.4)	-	-
<b>Deaths from malaria</b>					
<b>Combined intervention and post intervention Years</b>					
<b>Chemoprevention alone</b>	4596.9	5	1.1 (0.4 to 2.5)	Reference	
<b>Vaccine alone</b>	4315.7	5	1.2 (0.4 to 2.7)	-4.8 (-261.1 to 69.6)	Reference
<b>Combination</b>	4472.8	3	0.7 (0.1 to 2.0)	39.6 (-151.5 to 85.5)	42.4 (-139.9 to 86.2)
<b>Intervention period</b>					
<b>Chemoprevention alone</b>	3874.1	5	1.3 (0.4 to 3.0)	Reference	
<b>Vaccine alone</b>	3651.0	4	1.1 (0.3 to 2.8)	16.2 (-211.7 to 77.5)	Reference
<b>Combination</b>	3780.1	1	0.3 (0 to 1.5)	79.8 (-72 to 97.6)	-
<b>Post intervention period years 1-3 combined</b>					
<b>Chemoprevention alone</b>	722.8	0	0 (0 to 5.1)	Reference	
<b>Vaccine alone</b>	664.7	1	1.5 (0 to 8.4)	-	Reference
<b>Combination</b>	692.7	2	2.9 (0.3 to 10.4)	-	-

**Table 8.** Deaths from all causes, deaths excluding trauma and deaths from malaria during combined intervention and post intervention periods and intervention and post intervention periods separately in children in the older age cohort.

Variable	Person-yr at Risk	Events no.	Incidence (95% CI) no. of events/1000 person-yr at risk	Protective Efficacy, Vaccine Alone or Combination vs. Chemoprevention (95% CI)	Protective Efficacy, Combination vs. Vaccine Alone (95% CI)
<b>Deaths (all causes)</b>					
<b>Combined intervention and post intervention Years</b>					
Chemoprevention alone	6665.7	22	3.3 (2.1 to 5)	Reference	
Vaccine alone	7115.8	27	3.8 (2.5 to 5.5)	-17.5 (-106.6 to 33.2)	Reference
Combination	6892.1	13	1.9 (1.0 to 3.2)	42.2 (-15 to 71)	50.9 (4.8 to 74.7)
<b>Intervention period</b>					
Chemoprevention alone	3977.6	17	4.3 (2.5 to 6.8)	Reference	
Vaccine alone	4247.6	20	4.7 (2.9 to 7.3)	-13.5 (-117 to 40.7)	Reference
Combination	4083.9	12	2.9 (1.5 to 5.1)	30.2 (-46.3 to 66.7)	38.6 (-25.3 to 69.9)
<b>Post intervention period years 1-3 combined, both countries</b>					
Chemoprevention alone	2688.2	5	1.9 (0.6 to 4.3)	Reference	
Vaccine alone	2868.2	7	2.4 (1.0 to 5.0)	-30.5 (-309.6 to 58.4)	Reference
Combination	2808.1	1	0.4 (0 to 2.0)	80.9 (-62.5 to 97.8)	85.3 (-20.4 to 98.2)
<b>Deaths (excluding external causes and surgery)</b>					
<b>Combined intervention and post intervention Years</b>					
Chemoprevention alone	6665.7	18	2.7 (1.6 to 4.3)	Reference	

<b>Vaccine alone</b>	7115.8	20	2.8 (1.7 to 4.3)	-7.4 (-103.3 to 43.3)	Reference
<b>Combination</b>	6892.1	11	1.6 (0.8 to 2.9)	40 (-27.4 to 71.7)	44.1 (-16.7 to 73.2)
<b>Intervention period</b>					
<b>Chemoprevention alone</b>	3977.6	14	3.5 (1.9 to 5.9)	Reference	
<b>Vaccine alone</b>	4247.6	15	3.5 (2.0 to 5.8)	-4.4 (-116.7 to 49.7)	Reference
<b>Combination</b>	4083.9	10	2.4 (1.2 to 4.5)	29.1 (-60.0 to 68.6)	32.2 (-50.5 to 69.5)
<b>Post intervention period years 1-3 combined,</b>					
<b>Chemoprevention alone</b>	2688.2	4	1.5 (0.4 to 3.8)	Reference	
<b>Vaccine alone</b>	2868.2	5	1.7 (0.6 to 4.1)	-17.1 (-330.9 to 68.2)	Reference
<b>Combination</b>	2808.1	1	0.4 (0 to 2)	76.1 (-112.2 to 97.3)	79.4 (-78.3 to 97.6)
<b>Deaths from malaria</b>					
<b>Combined intervention and post intervention Years</b>					
<b>Chemoprevention alone</b>	6666.0	9	1.4 (0.6 to 2.6)	Reference	
<b>Vaccine alone</b>	7115.8	14	2.0 (1.1 to 3.3)	-50.8 (-248 to 34.7)	Reference
<b>Combination</b>	6892.1	3	0.7 (0.2 to 2.1)	67.2 (-21.3 to 91.1)	78.2 (24.6 to 93.7)
<b>Intervention period</b>					
<b>Chemoprevention alone</b>	3977.6	7	1.8 (0.7 to 3.6)	Reference	
<b>Vaccine alone</b>	4247.6	10	2.4 (1.1 to 4.3)	-39.9 (-268.7 to 46.9)	Reference
<b>Combination</b>	4083.9	3	0.7 (0.2 to 2.1)	57.4 (-65.2 to 89)	69.6 (-9.9 to 91.6)
<b>Post intervention period years 1-3 combined</b>					
<b>Chemoprevention alone</b>	2688.4	2	0.7 (0.1 to 2.7)	Reference	
<b>Vaccine alone</b>	2868.2	4	1.4 (0.4 to 3.6)	-	Reference
<b>Combination</b>	2808.1	0	0 (0 to 1.3)	-	-

**Table 9.** Phenotype of severe malaria in children the younger and older age cohorts combined in the intervention and post intervention periods in Burkina Faso and Mali. Deaths in hospital are shown in brackets.

Phenotype	Burkina Faso		Mali	
	Intervention	Post-intervention	Intervention	Post-intervention
Severe malaria anaemia	71 (13)	30 (3)	10	3
Cerebral malaria	1	0	9 (5)	3 (2)
Severe malaria with convulsion	36 (3)	12	7	7
Severe malaria with hyperparasitaemia	0	4	13	15
Severe malaria with prostration	18 (1)	32	1	3
Severe malaria with haemoglobinuria	2	4	0	0
All other forms of severe malaria	11 (6)	16 (3)	5 (2)	1 (1)