INTEGRATION Summary Results

Abbreviations

ANC	Antenatal care
IPTp	Intermittent preventive treatment in pregnancy
IPTp-SP	Intermittent preventive treatment in pregnancy with sulfadoxine-pyrimethamine
IPTp3+	Three or more doses of IPTp-SP
SMC	Seasonal malaria chemoprevention
SMC4	Four rounds of SMC

A. Baseline participant characteristics

A total of 810 participants in Burkina Faso and 780 in Mali were included in the study. Participants in Burkina Faso were older overall, with 39.5% aged ≥30 years, whereas the age distribution in Mali was younger, with the largest proportions aged 20–24 years (27.4%) and 25–29 years (24.0%). Most participants were married, particularly in Mali (97.7% vs 78.0% in Burkina Faso), while free union was common only in Burkina Faso (21.0%).

Educational attainment differed between settings, with 70.1% of participants in Burkina Faso reporting no schooling compared with 52.6% in Mali. Religious affiliation also varied markedly, with a predominantly Christian population in Burkina Faso (59.5%) and an overwhelmingly Muslim population in Mali (97.7%).

Most participants were multigravidae and had a parity of ≥2 in both countries. The sample was predominantly male (96.5% in Burkina Faso and 99.0% in Mali). Farming was the main occupation in Burkina Faso (80.6%), whereas occupations in Mali were more diverse, with similar proportions engaged in farming and other activities. Table 1 provides details on participants' characteristics.

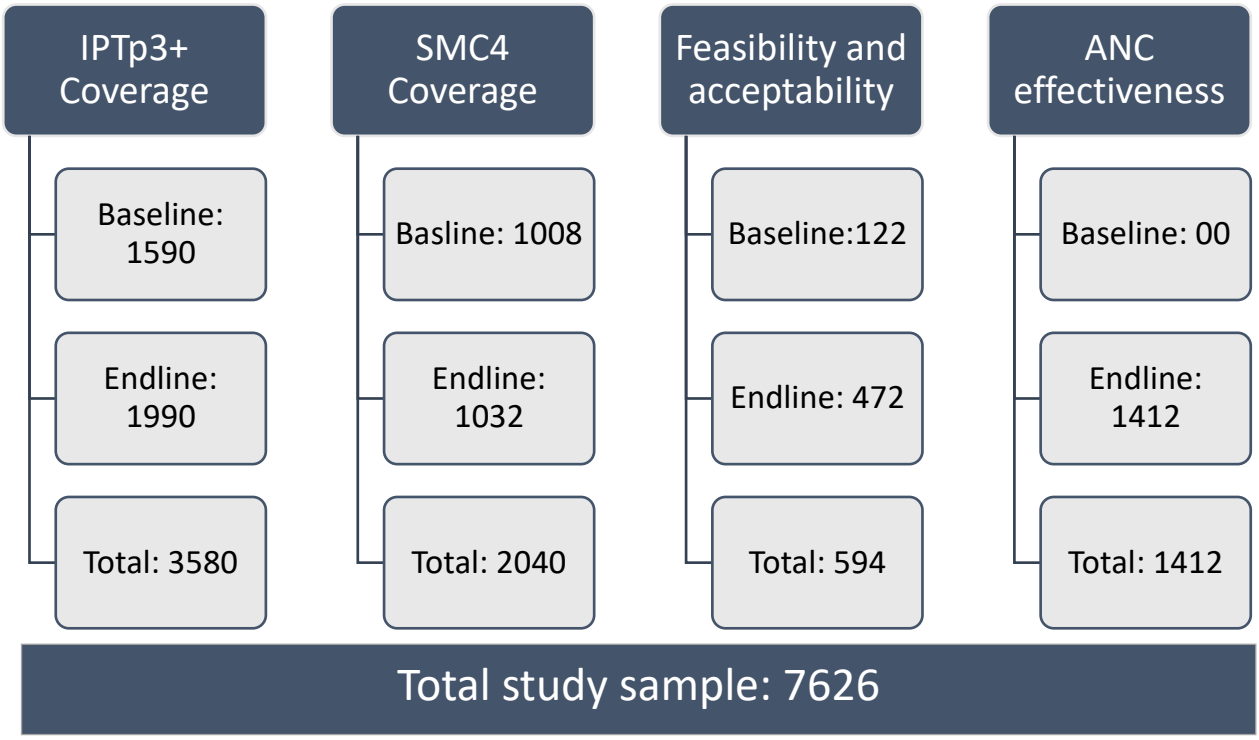
Table 1: Participant characteristics at baseline

Variable	**Burkina Faso**, N = 810	**Mali**, N = 780
Age		
<20	93 (11.5)	179 (22.9)
20-24	213 (26.3)	214 (27.4)
25-29	184 (22.7)	187 (24.0)
>=30	320 (39.5)	200 (25.6)
Marital status		
Free union/concubinage	170 (21.0)	1 (0.1)
Married	632 (78.0)	762 (97.7)
Other	8 (1.0)	17 (2.2)
Schooling		
Non	568 (70.1)	410 (52.6)
Oui	242 (29.9)	370 (47.4)

Education	0 (NA)	0 (NA)
Missing data	810	780
Religion		
Christian	482 (59.5)	3 (0.4)
Muslim	312 (38.5)	762 (97.7)
Other	16 (2.0)	15 (1.9)
Gravidity		
Multigravidae	658 (81.2)	657 (84.3)
Primividae	152 (18.8)	122 (15.7)
Missing data	0	1
Parity		
>=2	650 (80.2)	641 (82.3)
1	160 (19.8)	138 (17.7)
Missing data	0	1
Sexe		
Female	28 (3.5)	8 (1.0)
Male	782 (96.5)	772 (99.0)
Occupation		
Farmer	653 (80.6)	349 (44.7)
Other	88 (10.9)	359 (46.0)
Salary worker	8 (1.0)	22 (2.8)
Trader	61 (7.5)	50 (6.4)

B. Flow diagram

A total of 7626 participants were included in the trial.



C. Adverse events

No serious adverse events were reported. A few cases of nausea, vomiting, and pruritic were reported as side effects of IPTp-SP.

D. Outcomes

I. **Primary endpoint**: Receiving ≥3 doses of IPTp-SP

There was no difference in IPTp3+ coverage between study arms in Burkina Faso (Table 2). In Mali, there was a significant difference in IPTp3+ coverage between study arms, with more women receiving 3+ doses in the intervention arm (Table 3).

Table 2: IPTp3+ coverage by study arm, Burkina Faso

Intervention	Unadjusted crude effect		Principal analysis		Sensitivity analysis 1		Sensitivity analysis 2	
	IPTp-SP3+ coverage n/N' if different from N (%)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value
ANC (N= 492)	398/481 (82.74)							

ANC+SMC (N=490)	398/486 (81.89)	0.728	0.94 (0.56 – 1.60)	0.832	1.05 (0.63 – 1.74)	0.8484	1.07 (0.59 – 1.93)	0.831

Table 3: IPTp3+ coverage per study arm, Mali

Intervention	Unadjusted crude effect		Principal analysis		Sensitivity analysis 1		Sensitivity analysis 2	
	IPTp-SP3+ coverage n/N' if different from N (%)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value
ANC (N=504)	285/480 (59.38)							
ANC+SMC (N=504)	378/481 (78.59)	<0.0001	2.59 (1.45 – 4.61)	0.0012	2.68 (1.62 – 4.43)	0.0001	3.01 (1.73 – 5.23)	0.0001

II. Secondary endpoints

1. Coverage of any dose of IPTp-SP

In Burkina Faso, there was no difference between arms in the coverage of women who received any dose of IPTp-SP (Table 4). In Mali more women received any dose of IPTp-SP in the control arm than the intervention arm (Table 5).

Table 4: Coverage of any dose of IPTp-SP by study arm, Burkina Faso

N# of doses	Intervention	Unadjusted crude effect		Principal analysis		Sensitivity analysis 1		Sensitivity analysis 2	
		IPTp-SP coverage n/N' if different from N (%)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value
1	ANC (N=492)	15/481 (3.12)							
	ANC+SMC (N=490)	16/486 (3.29)	0.8782	1.05 (0.48 – 2.32)	0.8963	1.17 (0.50 – 2.72)	0.7133	1.03 (0.45 – 2.35)	0.9378
2	ANC	68/481 (14.14)							
	ANC+SMC	72/486 (14.81)	0.7646	1.06 (0.66 – 1.69)	0.8033	1.00 (0.65 – 1.55)	0.9942	1.00 (0.58 – 1.73)	0.9883

Table 5: Coverage of any dose of IPTp-SP by study arm, Mali

N# of doses	Intervention	Unadjusted crude effect		Principal analysis		Sensitivity analysis 1		Sensitivity analysis 2	
		IPTp-SP coverage n/N' if different from N (%)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value

1	ANC (N=504)	89/480 (18.54)							
	ANC+SMC (N=504)	36/481 (7.48)	<0.0001	0.39 (0.20 – 0.78)	0.0072	0.41 (0.21 – 0.80)	0.0086	0.33 (0.32 – 0.33)	<0.0001
2	ANC	105/480 (21.88)							
	ANC+SMC	67/481 (13.93)	0.0013	0.54 (0.34 – 0.85)	0.0076	0.48 (0.32 – 0.74)	0.0009	0.52 (0.33 – 0.81)	0.0036

2. Coverage of 4 or more antenatal care (ANC) visits

There was no difference in the coverage of 4 or more ANC visits between study arms in Burkina Faso (Table 6). In Mali, the coverage of attending 4 or more visits was higher in the intervention arm than the control arm when the variability between villages was taken into account.

Table 6: Coverage of 4 or more ANC visits by study arm, Burkina Faso

N# of visits	Intervention	Unadjusted crude effect		Principal analysis		Sensitivity analysis 1		Sensitivity analysis 2	
		ANC visits coverage n/N' if different from N (%)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value
>=4	ANC (N=492)	369 (75.15)							
	ANC+SMC (N=490)	375 (76.53)	0.6142	1.09 (0.70 – 1.68)	0.7136	1.23 (0.79 – 1.92)	0.3604	1.09 (0.69 – 1.72)	0.7047

Table 7: Coverage of 4 or more ANC visits by study arm, Mali

N# of visits	Intervention	Unadjusted crude effect		Principal analysis		Sensitivity analysis 1		Sensitivity analysis 2	
		ANC visits coverage n/N' if different from N (%)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value
>=4	ANC (N=504)	248 (49.21)							
	ANC+SMC (N=504)	280 (55.56)	0.0436	1.26 (0.78 – 2.04)	0.3544*	1.14 (0.75 – 1.74)	0.5499	1.66 (1.05 – 2.62)	0.0295*

*This result shows that between villages variability on the probability attending at least 4 ANC visits is important in ML (variance=0.39) and failing to account for this level of variability results in underestimating the intervention effect on this endpoint (p=0.3544).

3. Coverage of 4 rounds of SMC

There was no difference in the coverage of 4 rounds of SMC between study arms in either country.

Table 8: Coverage of 4 rounds of SMC between study arms, Burkina Faso

Intervention	Unadjusted crude effect		Principal analysis		Sensitivity analysis 1		Sensitivity analysis 2	
	SMC4+ coverage n/N' if different from N (%)	P-value	OR (95% CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value
ANC (N=70)	66 (94.29)							
ANC+SMC (N=70)	64 (91.43)	0.5116	0.51 (0.09 – 2.84)	0.4429	0.29 (0.02 – 3.48)	0.3309	0.51 (0.09 – 2.84)	0.4429

Table 9: Coverage of 4 rounds of SMC between study arms, Mali

Intervention	Unadjusted crude effect		Principal analysis		Sensitivity analysis 1		Sensitivity analysis 2	
	SMC4+ coverage n/N' if different from N (%)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value
ANC (N=429)	243 (56.64)							
ANC+SMC (N=463)	307 (66.31)	0.0030	1.81 (0.95 – 3.47)	0.0709	1.40 (0.67 – 2.96)	0.3711	1.63 (0.76 – 3.50)	0.2085

4. Feasibility and acceptability

Delivering IPTp-SP through SMC is a promising complementary strategy to ANC, especially in settings with low ANC attendance. The strategy is feasible and acceptable to key stakeholders, though ANC delivery is preferred. Women doubt CHWs' competence and value ANC providers' expertise in assessing pregnancy and managing SP side effects, so clear referral pathways, defined roles, and CHW training and supervision are essential. Implementation barriers need to be addressed, and the community engaged for successful and sustained scale up.

5. ANC delivery effectiveness of IPTp-SP

IPTp-SP delivery effectiveness was significantly higher in intervention facilities in both Mali (79.2%, 95% CI 74.0%–84.3%) compared with control facilities (68.7%, 95% CI 63.4%–73.9%; p = 0.006), and in Burkina Faso (52.3%, 95% CI 46.9%–57.8% vs 28.7%, 95% CI 23.9%–33.6%; p < 0.0001). Factors associated with receiving IPTp-SP by directly observed therapy included attendance at routine ANC visits in Mali, and gestational age, multiparity, and routine ANC attendance in Burkina Faso. ANC providers reported that delivering IPTp-SP through SMC increased ANC attendance, reduced malaria cases, and was both feasible and acceptable.

E. Conclusion

Delivering IPTp-SP through SMC in addition to routine ANC increased IPTp3+ coverage in Mali but not in Burkina Faso. In Mali, the intervention was also associated with increased ANC4 attendance at intervention facilities, whereas no corresponding increase was observed in Burkina Faso. The strategy did not result in changes in SMC4 coverage in either country. Training of ANC providers was associated with improved IPTp-SP delivery effectiveness, with a stronger effect observed in Mali than in Burkina Faso. Overall, the new delivery strategy was considered feasible by ANC providers and CHWs and acceptable to all stakeholder groups; however, ANC-based delivery was preferred because of perceived safety.