

## Supporting Information

### Co-infection prevalence and risk factors: malaria and curable sexually transmitted and reproductive tract infections at antenatal care booking in Kenya, Malawi, and Tanzania

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**Table 1: IMPROVE intervention arms**

Arm	Drug regimen
<b>IPTp-SP</b>	This is the control arm and consists of a standard single-day stat course of 3 tablets of quality-assured SP (tablets of 500 mg of sulphadoxine and 25 mg of pyrimethamine) provided at enrolment and at each subsequent monthly ANC visit in the 2 <sup>nd</sup> and 3 <sup>rd</sup> trimester.
<b>IPTp-DP + Azithromycin placebo</b>	3 to 5 tablets of DP (tablets of 40 mg of dihydroartemisinin and 320 mg of piperazine, based on bodyweight) daily for 3 days, plus 1 tablet of placebo Azithromycin (AZ) daily for 2 days. The dose of DP is equivalent to the standard treatment (case-management) dose for malaria in adults recommended by WHO with a target dose (range) of 4 (2-10) mg/kg bodyweight per day dihydroartemisinin and 18 (16-27) mg/kg bodyweight per day piperazine given once a day for 3 days for adults and children weighing $\geq 25$ kg (36-60 kg: 3 tablets, 60-80 kg:4 tablets, $\geq 80$ kg 5 tablets). One 3-day course was provided at enrolment and again at each subsequent monthly ANC visit in the 2 <sup>nd</sup> and 3 <sup>rd</sup> trimester. The weight at enrolment was used to define the weight class to guide treatment both at enrolment and subsequent scheduled visits.
<b>IPTp-DP + Azithromycin</b>	3 to 5 tablets of DP (based on bodyweight) daily for 3 days, plus two azithromycin tablets containing 500 given orally once daily for 2 consecutive days (cumulative dose of 2 g) at the same time as the first and second daily dose of DP at enrolment. DP course was provided at enrolment and again at each subsequent monthly ANC visit in the 2 <sup>nd</sup> and 3 <sup>rd</sup> trimester.

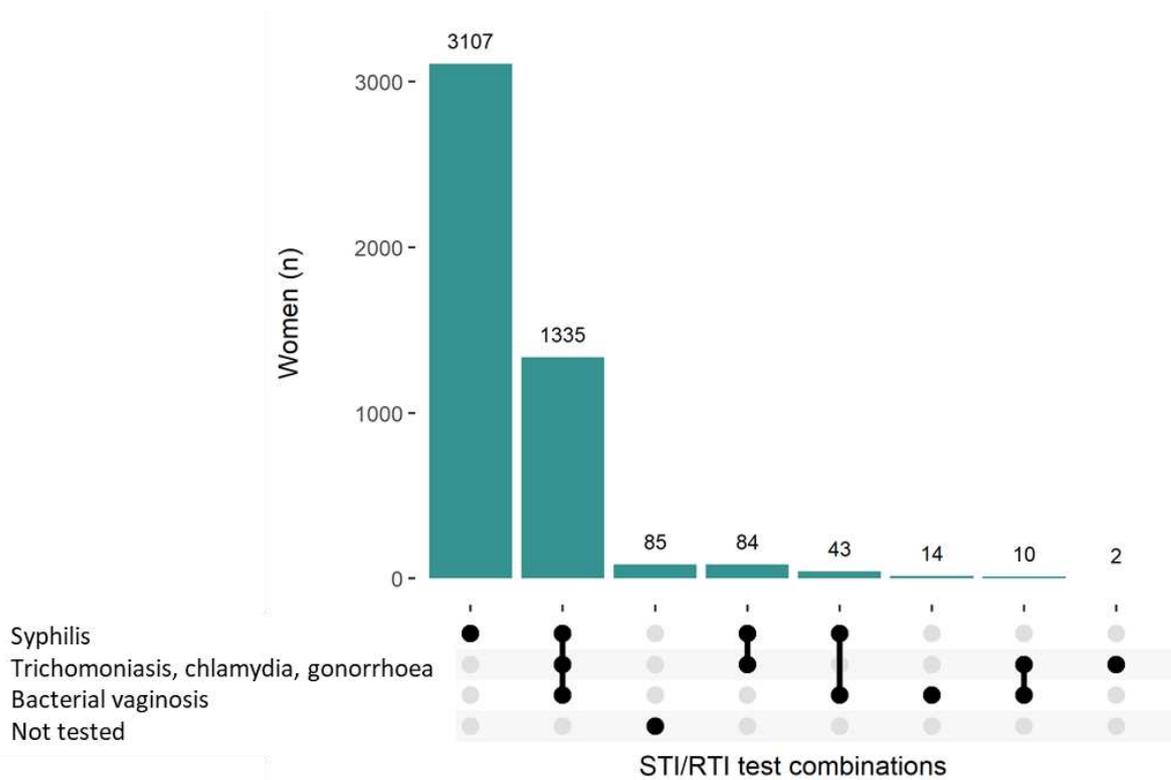


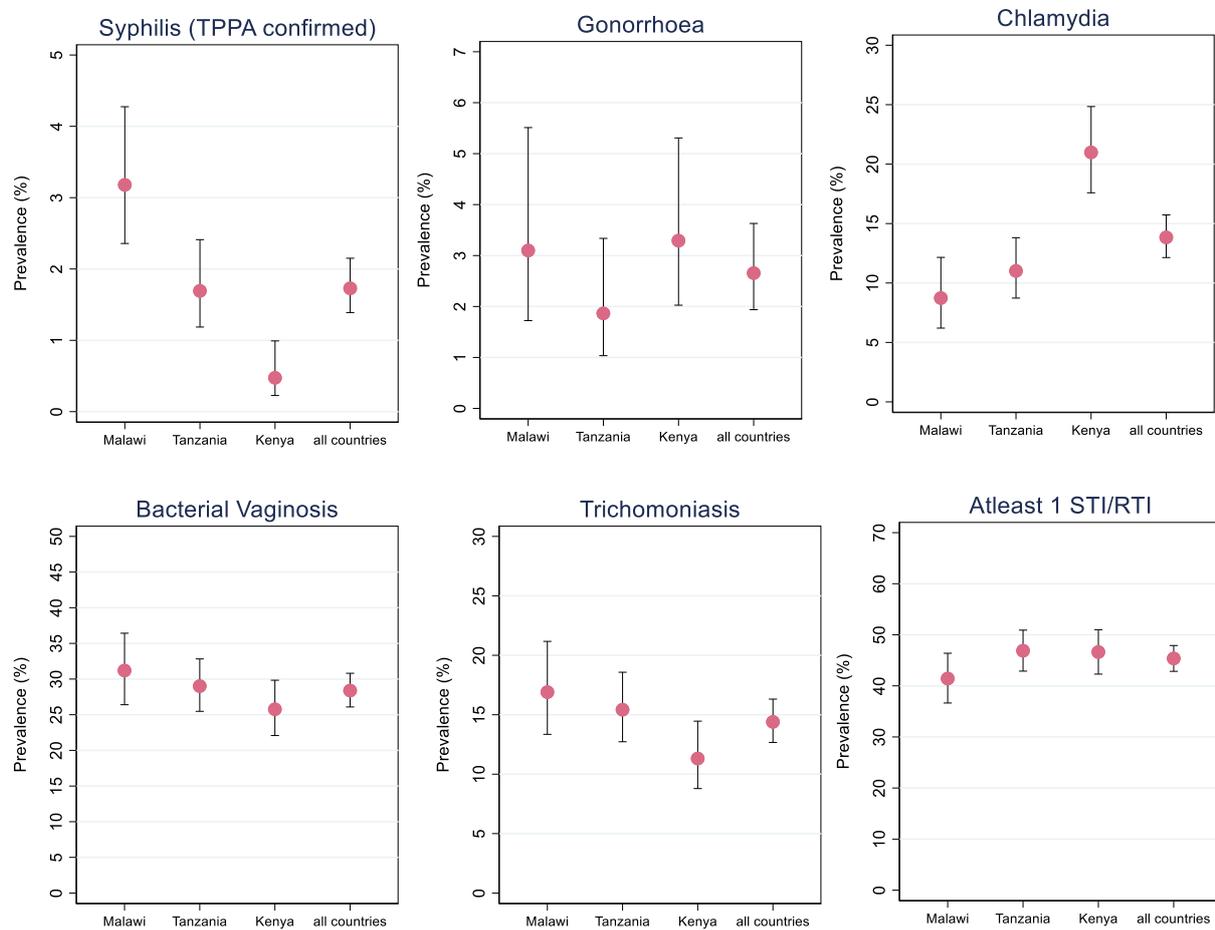
Figure 1: Unique STI/RTI test combinations and number tested

Number of STI/RTIs tested for	Women (n)	Percentage (%)
1	3,121	67.9
2	43	0.9
3	2	0.04
4	94	2.1
5	1,335	29.1
Total	4,595	100.0

Table 2: Total number of STI/RTI tests done per woman

**Table 3: Bacterial vaginosis and syphilis infection results**

Infection	Categorical Outcome	N Positive / N Tested	Percentage (%)
Bacterial Vaginosis (Nugent score)	7-10 (positive)	399/1402	28.5
	4-6 (intermediate)	137/1402	9.8
	0-3 (negative)	866/1402	61.8
Syphilis (RPR titre)	$\geq 1:8$	34/79	43.0
	$\leq 1:4$	45 /79	57.0

**Figure 2: Prevalence of each individual infection and prevalence of at least one of chlamydia, gonorrhoea, trichomoniasis, or bacterial vaginosis**

**Table 4: Logistic regression models for association of risk factors with syphilis prevalence (all models controlled for country and site)**

		N with STI/N tested (prevalence (%))	Univariable		Multivariable 1		Multivariable 2	
			PR (95%CI)	p-value	PR (95%CI)	p-value	PR (95%CI)	p-value
<b>Maternal age</b>	<b>&lt;25 years</b>	38/2,423 (1.6)	ref		ref		1.4 (0.4, 4.9)	0.578
	<b>≥25 years</b>	41/2,135 (1.9)	1.70 (1.09, 2.66)	0.020	0.79 (0.21, 2.97)	0.731	ref	
<b>Gravidity</b>	<b>Paucigravid</b>	32/2,523 (1.3)	ref		ref		0.5 (0.2, 1.7)	0.274
	<b>Multigravid</b>	47/2,003 (2.3)	1.18 (0.76, 1.83)	0.465	1.91 (0.53, 6.90)	0.325	ref	
<b>Marital status</b>	<b>Single</b>	4/566 (0.7)	ref		ref			
	<b>Married</b>	75/4,001 (1.9)	1.74 (0.62, 4.90)	0.296	0.70 (0.18, 2.74)	0.609		
<b>SES tercile</b>	<b>low</b>	44/1,516 (2.9)	ref		ref		8.8 (1.0, 76.1)	0.048
	<b>medium</b>	26/1,525 (1.7)	1.01 (0.61, 1.67)	0.964	1.33 (0.47, 3.76)	0.585	8.8 (1.1, 68.1)	0.037
	<b>high</b>	9/1,528 (0.6)	0.36 (0.16, 0.80)	0.012	0.16 (0.02, 1.45)	0.103	ref	
<b>Maternal education</b>	<b>none/primary</b>	65/2,962 (2.2)	ref		ref			
	<b>Secondary</b>	14/1,598 (0.9)	0.50 (0.28, 0.90)	0.021	0.87 (0.31, 2.48)	0.795		
<b>Residency</b>	<b>Rural</b>	67/3,351 (2.0)	ref		Ref			
	<b>Semi-/Urban</b>	12/1,216 (1.0)	0.47 (0.25, 0.88)	0.019	0.93 (0.30, 2.84)	0.894		
<b>Anaemia</b>	<b>No</b>	45/2,535 (1.8)	ref		ref			
	<b>Yes</b>	34/2,017 (1.7)	1.0 (0.65, 1.56)	0.983	2.27 (1.02, 5.09)	0.046		
<b>BV</b>	<b>Negative</b>	9/988 (0.9)	ref		ref		ref	
	<b>Positive</b>	14/390 (3.6)	3.77 (1.66, 8.57)	0.002	3.73 (1.68, 8.31)	0.001	3.7 (1.6, 8.4)	0.002
Multivariable 1: controlling for all variables								
Multivariable 2: controlling just for variables relevant in step-wise method (change PR by 10%). NB in some cases, reference groups changed for ease of interpretation								

**Table 5: Logistic regression models for association of risk factors with chlamydia prevalence (all models controlled for country and site)**

		N with STI/N tested (prevalence (%))	Univariable		Multivariable 1		Multivariable 2	
			PR (95%CI)	p-value	PR (95%CI)	p-value	PR (95%CI)	p-value
<b>Maternal age</b>	<b>&lt;25 years</b>	124/763 (16.3)	ref		ref		1.0 (0.7, 1.4)	0.955
	<b>≥25 years</b>	74/668 (11.1)	0.73 (0.55, 0.96)	0.022	0.97 (0.69, 1.37)	0.852	ref	
<b>Gravidity</b>	<b>Paucigravid</b>	137/783 (17.5)	ref		ref		1.7 (1.2, 2.4)	0.002
	<b>Multigravid</b>	61/642 (9.5)	0.58 (0.44, 0.77)	0.000	0.66 (0.46, 0.93)	0.018	ref	
<b>Marital status</b>	<b>Single</b>	36/176 (20.5)	ref		ref			
	<b>Married</b>	162/1254 (12.9)	0.83 (0.59, 1.16)	0.268	1.08 (0.75, 1.57)	0.670		
<b>SES tercile</b>	<b>low</b>	38/466 (8.2)	ref		ref			
	<b>medium</b>	82/485 (16.9)	1.67 (1.08, 2.59)	0.021	1.54 (0.97, 2.45)	0.070		
	<b>high</b>	78/480 (16.3)	1.64 (1.04, 2.60)	0.034	1.48 (0.86, 2.55)	0.156		
<b>Maternal education</b>	<b>none/primary</b>	114/900 (12.7)	ref		ref			
	<b>Secondary</b>	83/528 (15.7)	1.14 (0.86, 1.51)	0.353	0.91 (0.66, 1.26)	0.573		
<b>Residency</b>	<b>Rural</b>	141/1045 (13.5)	ref		ref			
	<b>Semi-/Urban</b>	57/385 (14.8)	1.49 (1.05, 2.11)	0.025	1.40 (0.96, 2.04)	0.084		
<b>Anaemia</b>	<b>No</b>	94/777 (12.1)	ref		ref			
	<b>Yes</b>	104/651 (16.0)	1.25 (0.97, 1.62)	0.085	1.30 (0.99, 1.70)	0.055		
<b>BV</b>	<b>Negative</b>	120/961 (12.5)	ref		ref			
	<b>Positive</b>	73/384 (19.0)	1.55 (1.19, 2.02)	0.001	1.51 (1.16, 1.96)	0.002		
Multivariable 1: controlling for all variables								
Multivariable 2: controlling just for variables relevant in step-wise method (change PR by 10%). NB in some cases, reference groups changed for ease of interpretation								

**Table 6: Logistic regression models for association of risk factors with bacterial vaginosis prevalence (all models controlled for country and site)**

		N with STI/N tested (prevalence (%))	Univariable		Multivariable 1		Multivariable 2	
			PR (95%CI)	p-value	PR (95%CI)	p-value	PR (95%CI)	p-value
<b>Maternal age</b>	<b>&lt;25 years</b>	222/744 (29.8)	ref		ref		1.0 (0.8, 1.2)	0.752
	<b>≥25 yrs</b>	177/658 (26.9)	0.89 (0.75, 1.05)	0.156	1.03 (0.83, 1.29)	0.767	ref	
<b>Gravidity</b>	<b>Paucigravid</b>	241/774 (31.1)	ref		ref		1.3 (1.1, 1.6)	0.018
	<b>Multigravid</b>	156/623 (25.0)	0.79 (0.66, 0.93)	0.006	0.77 (0.62, 0.97)	0.025		
<b>Marital status</b>	<b>Single</b>	54/174 (31.0)	ref		ref			
	<b>Married</b>	344/1227 (28.0)	0.86 (0.67, 1.10)	0.225	0.94 (0.72, 1.22)	0.630		
<b>SES tercile</b>	<b>low</b>	133/440 (30.2)	ref		ref			
	<b>medium</b>	129/474 (27.2)	0.97 (0.77, 1.22)	0.786	0.94 (0.74, 1.19)	0.610		
	<b>high</b>	137/488 (28.1)	1.00 (0.79, 1.26)	0.997	0.97 (0.74, 1.28)	0.827		
<b>Maternal education</b>	<b>none/primary</b>	245/869 (28.2)	ref		ref			
	<b>Secondary</b>	153/530 (28.9)	1.07 (0.90, 1.28)	0.439	1.02 (0.83, 1.26)	0.815		
<b>Residency</b>	<b>Rural</b>	294/1026 (28.7)	ref		ref			
	<b>Semi-/Urban</b>	104/375 (27.7)	0.95 (0.76, 1.20)	0.670	0.93 (0.73, 1.19)	0.574		
<b>Anaemia</b>	<b>No</b>	220/766 (28.7)	ref		ref			
	<b>Yes</b>	177/633 (28.0)	0.99 (0.83, 1.17)	0.893	0.96 (0.81, 1.14)	0.630		
Multivariable 1: controlling for all variables								
Multivariable 2: controlling just for variables relevant in step-wise method (change PR by 10%). NB in some cases, reference groups changed for ease of interpretation								

**Table 7: Logistic regression models for association of risk factors with gonorrhoea prevalence (all models controlled for country and site)**

		N with STI/N tested (prevalence (%))	Univariable		Multivariable 1		Multivariable 2	
			PR (95%CI)	p-value	PR (95%CI)	p-value	PR (95%CI)	p-value
<b>Maternal age</b>	<b>&lt;25 years</b>	28/763 (3.7)	ref		ref		1.6 (0.7, 3.3)	0.237
	<b>≥25 yrs</b>	10/668 (1.5)	0.44 (0.21, 0.93)	0.031	0.66 (0.31, 1.39)	0.274	ref	
<b>Gravidity</b>	<b>Paucigravid</b>	29/783 (3.7)	ref		ref		2.5 (1.2, 5.4)	0.018
	<b>Multigravid</b>	9/642 (1.4)	0.39 (0.18, 0.81)	0.012	0.40 (0.19, 0.88)	0.022	ref	
<b>Marital status</b>	<b>Single</b>	8/176 (4.5)	ref		ref			
	<b>Married</b>	30/1254 (2.4)	0.64 (0.30, 1.34)	0.231	0.88 (0.41, 1.91)	0.746		
<b>SES tercile</b>	<b>low</b>	14/466 (3.0)	ref		ref		0.9 (0.3, 2.6)	0.876
	<b>medium</b>	11/485 (2.3)	0.58 (0.20, 1.72)	0.327	0.50 (0.17, 1.47)	0.209	0.5 (0.2, 1.0)	0.054
	<b>high</b>	13/480 (2.7)	0.79 (0.28, 2.20)	0.653	1.06 (0.35, 3.23)	0.923	ref	
<b>Maternal education</b>	<b>none/primary</b>	27/900 (3.0)	ref		ref		2.4 (1.2, 5.1)	0.016
	<b>Secondary</b>	11/528 (2.1)	0.67 (0.32, 1.39)	0.281	0.40 (0.20, 0.82)	0.012	ref	
<b>Residency</b>	<b>Rural</b>	29/1045 (2.8)	ref		ref			
	<b>Semi-/Urban</b>	9/385 (2.3)	1.07 (0.50, 2.25)	0.869	1.27 (0.54, 2.99)	0.579		
<b>Anaemia</b>	<b>No</b>	18/777 (2.3)	ref		ref			
	<b>Yes</b>	20/651 (3.1)	1.43 (0.78, 2.63)	0.245	1.17 (0.63, 2.17)	0.608		
<b>BV</b>	<b>Negative</b>	21/961 (2.2)	ref		ref		ref	
	<b>Positive</b>	16/384 (4.2)	2.03 (1.06, 3.89)	0.032	1.79 (0.94, 3.39)	0.075	1.8 (1.0, 3.4)	0.074
Multivariable 1: controlling for all variables								
Multivariable 2: controlling just for variables relevant in step-wise method (change PR by 10%)								

NB reference groups changed in main paper

**Table 8: Logistic regression models for association of risk factors with trichomoniasis prevalence (all models controlled for country and site)**

		N with STI/N tested (prevalence (%))	Univariable		Multivariable 1		Multivariable 2	
			PR (95%CI)	p-value	PR (95%CI)	p-value	PR (95%CI)	p-value
<b>Maternal age</b>	<b>&lt;25 years</b>	115/763 (15.1)	ref		ref		ref	
	<b>≥25 years</b>	92/668 (13.8)	0.90 (0.69, 1.16)	0.405	0.83 (0.59, 1.17)	0.278	0.90 (0.70, 1.17)	0.435
<b>Gravidity</b>	<b>Paucigravid</b>	113/783 (14.4)	ref		ref			
	<b>Multigravid</b>	94/642 (14.6)	1.01 (0.78, 1.30)	0.954	1.03 (0.73, 1.46)	0.860		
<b>Marital status</b>	<b>Single</b>	30/176 (17.0)	ref		ref			
	<b>Married</b>	177/1254 (14.1)	0.75 (0.52, 1.08)	0.118	0.79 (0.54, 1.17)	0.237		
<b>SES tercile</b>	<b>low</b>	85/466 (18.2)	ref		ref			
	<b>medium</b>	60/485 (12.4)	0.76 (0.54, 1.07)	0.114	0.85 (0.59, 1.21)	0.365		
	<b>high</b>	62/480 (12.9)	0.78 (0.54, 1.11)	0.165	1.00 (0.66, 1.52)	0.986		
<b>Maternal education</b>	<b>none/primary</b>	145/900 (16.1)	ref		ref			
	<b>Secondary</b>	62/528 (11.7)	0.75 (0.56, 1.00)	0.047	0.76 (0.54, 1.06)	0.109		
<b>Residency</b>	<b>Rural</b>	158/1045 (15.1)	ref		ref			
	<b>Semi-/Urban</b>	49/385 (12.7)	0.74 (0.52, 1.06)	0.097	0.77 (0.53, 1.13)	0.183		
<b>Anaemia</b>	<b>No</b>	113/777 (14.5)	ref		ref			
	<b>Yes</b>	94/651 (14.4)	1.09 (0.84, 1.41)	0.524	1.03 (0.78, 1.35)	0.848		
<b>BV</b>	<b>Negative</b>	145/961 (15.1)	ref		ref			
	<b>Positive</b>	52/384 (13.5)	0.89 (0.66, 1.20)	0.439	0.88 (0.66, 1.18)	0.403		
Multivariable 1: controlling for all variables								
Multivariable 2: controlling just for variables relevant in step-wise method (change PR by 10%)								

**Table 9: Logistic regression models for association of risk factors with at least one of CT/NG/TV/BV prevalence (all models controlled for country and site)**

		N with STI/N tested (prevalence (%))	Univariable		Multivariable 1		Multivariable 2	
			PR (95%CI)	p-value	PR (95%CI)	p-value	PR (95%CI)	p-value
<b>Maternal age</b>	<b>&lt;25 years</b>	385/797 (48.3)	ref		ref		ref	
	<b>≥25 years</b>	298/691 (43.1)	0.88 (0.79, 0.99)	0.031	1.03 (0.83, 1.29)	0.767	0.95 (0.82, 1.09)	0.446
<b>Gravidity</b>	<b>Paucigravid</b>	402/821 (49.0)	ref		ref		ref	
	<b>Multigravid</b>	279/661 (42.2)	0.86 (0.76, 0.96)	0.007	0.77 (0.62, 0.97)	0.025	0.88 (0.76, 1.02)	0.090
<b>Marital status</b>	<b>Single</b>	96/182 (52.7)	ref		ref			
	<b>Married</b>	586/1305 (44.9)	0.88 (0.75, 1.03)	0.102	0.94 (0.72, 1.22)	0.630		
<b>SES tercile</b>	<b>low</b>	225/483 (46.6)	ref		ref			
	<b>medium</b>	230/503 (45.7)	0.93 (0.80, 1.09)	0.386	0.94 (0.74, 1.19)	0.610		
	<b>high</b>	228/502 (45.4)	0.93 (0.79, 1.09)	0.388	0.97 (0.74, 1.28)	0.827		
<b>Maternal education</b>	<b>none/primary</b>	429/931 (46.1)	ref		ref			
	<b>Secondary</b>	252/554 (45.5)	1.00 (0.89, 1.13)	0.988	1.02 (0.83, 1.26)	0.815		
<b>Residency</b>	<b>Rural</b>	506/1083 (46.7)	ref		ref			
	<b>Semi-/Urban</b>	176/404 (43.6)	0.97 (0.83, 1.13)	0.681	0.93 (0.73, 1.19)	0.574		
<b>Anaemia</b>	<b>No</b>	367/810 (45.3)	ref		ref			
	<b>Yes</b>	314/675 (46.5)	1.03 (0.92, 1.16)	0.551	0.96 (0.81, 1.14)	0.630		
Multivariable 1: controlling for all variables								
Multivariable 2: controlling just for variables relevant in step-wise method (change PR by 10%)								

Table 10: Proportion of women positive with each individual STI/RTI who are co-infected with each of the other four STI/RTIs

Among women positive for...	...proportion co-infected with: n/N, % (95% CI)				
	Bacterial vaginosis	Trichomoniasis	Gonorrhoea	Chlamydia	Syphilis
Bacterial vaginosis		52/384, 13.5 (10.5, 17.4)	16/384, 4.2 (2.6, 6.7)	73/384, 19.0 (15.4, 23.3)	14/391, 3.6 (2.1, 6.0)
Trichomoniasis	52/197, 26.4 (20.7, 33.1)		8/207, 3.9 (1.9, 7.6)	34/207, 16.4 (11.9, 22.2)	8/205, 3.9 (2.0, 7.7)
Gonorrhoea	16/37, 43.2 (27.8, 60.1)	8/38, 21.1 (10.5, 37.6)		12/38, 31.6 (18.4, 48.6)	2/38, 5.3 (1.2, 19.8)
Chlamydia	73/193, 37.8 (31.2, 44.9)	34/198, 17.2 (12.5, 23.1)	12/198, 6.1 (3.5, 10.4)		4/196, 2.0 (0.8, 5.4)
Syphilis	14/23, 60.8 (38.6, 79.4)	8/24, 33.3 (16.7, 55.5)	2/24, 8.3 (1.9, 30.2)	4/24, 16.7 (5.9, 38.9)	

**Table 11: Multinomial logistic regression models for association of risk factors with the three most common co-infection combinations**

Co-infection		Gravidity	RRR (95% CI)	P-value
BV & TV (reference group: negative for BV & TV)	BV only	Pauci-	1.18 (0.83, 1.67)	0.351
		Multi-	ref	
	TV only	Pauci-	0.72 (0.45, 1.78)	0.194
		Multi-	ref	
	BV & TV	Pauci-	2.58 (1.16, 5.73)	0.020
		Multi-	ref	
BV & CT (reference group: negative for BV & CT)	BV only	Pauci-	1.22 (0.86, 1.74)	0.264
		Multi-	ref	
	CT only	Pauci-	1.41 (0.83, 2.39)	0.200
		Multi-	ref	
	BV & CT	Pauci-	2.86 (1.43, 5.70)	0.003
		Multi-	ref	
TV & CT (reference group: negative for CT & TV)	TV only	Pauci-	0.86 (0.55, 1.34)	0.500
		Multi-	ref	
	CT only	Pauci-	1.74 (1.10, 2.75)	0.018
		Multi-	ref	
	TV & CT	Pauci-	1.90 (0.70, 5.17)	0.204
		Multi-	ref	
NB. All models control for maternal age, maternal education, marital status, SES, residency (urban/rural), anaemic status, country, and site. BV= bacterial vaginosis, TV= trichomoniasis, CT = chlamydia				

Table 12: Association between each STI/RTIs pair (crude and adjusted):

Exposure	Outcome				
	Odds Ratio (95% CI), p-value				
	Bacterial vaginosis	Trichomoniasis	Gonorrhoea	Chlamydia	Syphilis
Bacterial vaginosis		C: 0.9 (0.7, 1.2), p=0.471	C: 1.9 (1.0, 3.6), p=0.048	C: 1.5 (1.2, 2.0), p=0.002	C: 3.9 (1.7, 9.0), p=0.001
		A: 0.9 (0.7, 1.2), p=0.403	A: 1.8 (0.9, 3.4), p=0.075	A: 1.5 (1.2, 2.0), p=0.002*	A: 3.7 (1.6, 8.6), p=0.002*
Trichomoniasis	C: 0.9 (0.7, 1.2), p=0.475		C: 1.6 (0.7, 3.4), p=0.244	C: 1.2 (0.9, 1.7), p=0.239	C: 3.1 (1.3, 6.8), p=0.011
	A: 0.9 (0.7, 1.2), p=0.402		A: 1.4 (0.6, 3.2), p=0.378	A: 1.3 (1.0, 1.9), p=0.076	A: 3.0 (1.4, 6.8), p=0.007
Gonorrhoea	C: 1.5 (1.1, 2.2), p=0.026	C: 1.5 (0.8, 2.8), p=0.227		C: 2.4 (1.5, 2.8), p=0.001	C: 3.3 (0.8, 12.6), p=0.097
	A: 1.5 (1.0, 2.3), p=0.033*	A: 1.4 (0.7, 2.7), p=.0321		A: 2.0 (1.2, 3.2), p=0.006*	A: 2.7 (0.8, 9.1), p=0.106
Chlamydia	C: 1.4 (1.1, 1.7), p=0.001	C: 1.2 (0.9, 1.7), p=0.238	C: 2.9 (1.5, 5.6), p=0.002		C: 1.2 (0.4, 3.6), p=0.683
	A: 1.4 (1.1, 1.7), p=0.001*	A: 1.4 (1.0, 1.9), p=0.068	A: 2.5 (1.2, 5.0), p=0.012*		A: 1.6 (0.6, 4.5), p=0.365
Syphilis	C: 2.2 (1.6, 3.1), p=<0.001	C: 2.4 (1.3, 4.2), p=0.004	C: 3.2 (0.8, 12.7), p=0.093	C: 1.2 (0.5, 3.0), p=0.678	
	A: 2.2 (1.5, 3.1), p=<0.001*	A: 2.3 (1.2, 4.2), p=0.008*	A: 2.6 (0.7, 10.4), p=0.192	A: 1.6 (0.7, 3.8), p=0.290	
C: Crude, A: Adjusted – controlling for all possible confounders.					
*adjusted model significant at p<0.05					

Table 13: Prevalence of malaria and curable STI/RTI co-infection

Co-infection status	Positive (n)	Tested (n)	Prevalence (%)	(95% CI)
<b>Malaria and:</b>				
<b>Syphilis</b>	8	4,129	0.2	0.1, 0.4
<b>Chlamydia</b>	30	1,346	2.2	1.6, 3.2
<b>Gonorrhoea</b>	9	1,346	0.7	0.3, 1.3
<b>Trichomoniasis</b>	21	1,346	1.6	1.0, 2.4
<b>Bacterial vaginosis</b>	55	1,317	4.2	3.2, 5.4
<b>any STI/RTI</b>	94	1,401	6.7	5.0, 8.9
<b>1 STI/RTI</b>	82	1,401	5.9	4.7, 7.2
<b>2 STI/RTIs</b>	11	1,401	0.8	0.4, 1.4
<b>3 STI/RTIs</b>	5	1,401	0.4	0.1, 0.9
<b>4 STI/RTIs</b>	1	1,401	0.1	0.0, 0.5

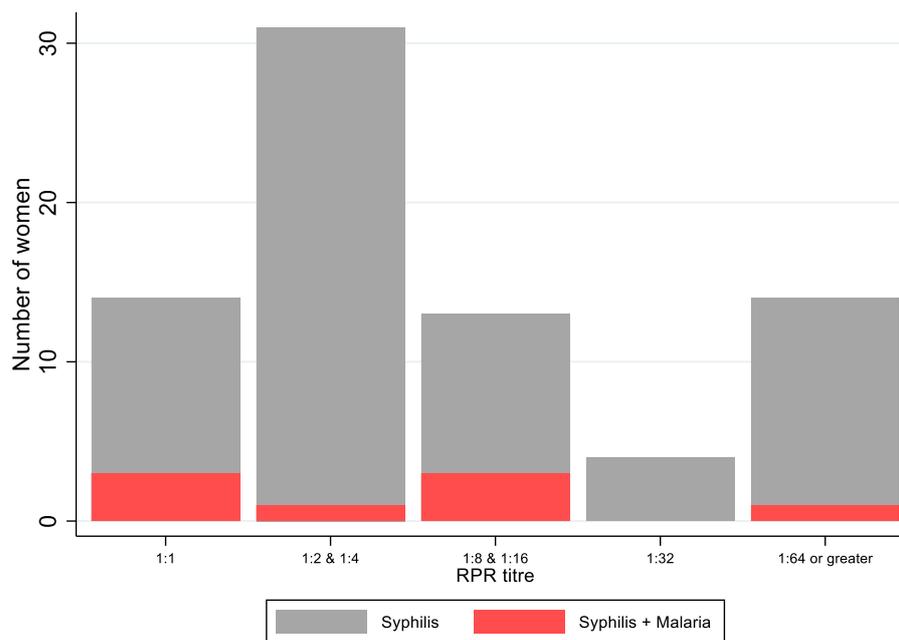
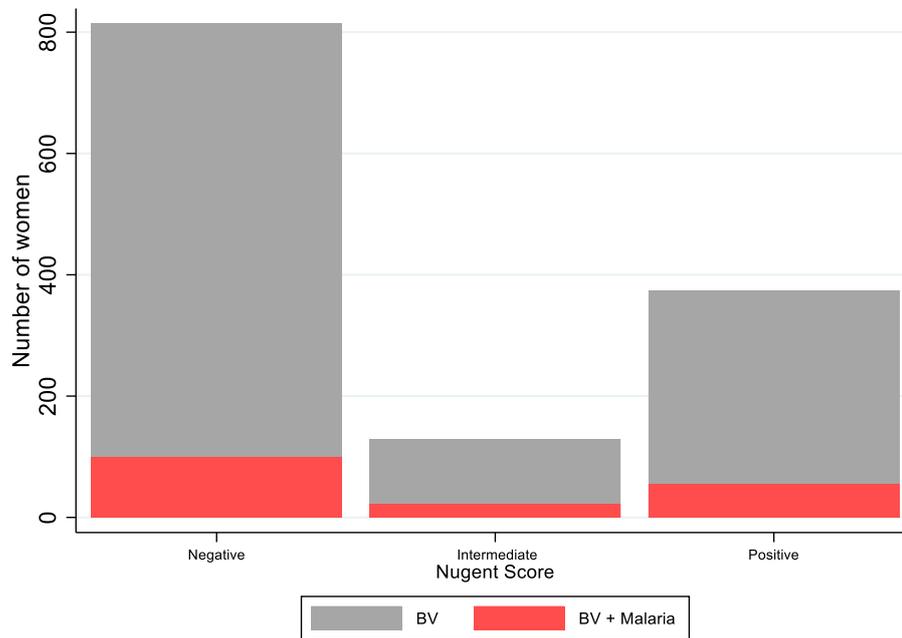


Figure 3: Number of TPPA confirmed syphilis cases by RPR titre (grey bar) and number co-infected with malaria (red bar)



**Figure 4: Number of BV cases by categorical Nugent score (grey bar) and number co-infected with malaria (red bar)**

**Table 14: Number and proportion of women co-infected with malaria by categorical BV and syphilis status**

		Malaria co-infected / total STI/RTI positive	Malaria prevalence % (95% CI)
BV	Negative (Nugent score 0-3)	99/814	12.16 (10.09, 14.60)
	Intermediate (Nugent score 4-6)	22/129	17.05 (11.49, 24.56)
	Positive (Nugent score $\geq 7$ )	55/374	14.71 (11.46, 18.67)
Syphilis	1:1	3/14	21.43 (6.88, 50.15)
	1:2 & 1:4	1/31	3.23 (4.32, 20.38)
	1:8 & 1:16	3/13	23.08 (7.42, 52.90)
	1:32	0/4	0.00
	>1:32	1/14	7.14 (9.51, 38.13)

Co-infection Combination	Infection Category	Risk Factor	RRR (95% CI)	P-value
Malaria & Bacterial Vaginosis (reference group: negative for both)	Malaria only	Rural	Ref	0.301
		Semi-/Urban	0.7 (0.4, 1.4)	
		No anaemia	Ref	<0.001
		Anaemia	3.7 (2.4, 5.9)	
	Bacterial Vaginosis only	Rural	Ref	0.931
		Semi-/Urban	1.0 (0.70, 1.5)	
		No anaemia	Ref	0.956
		Anaemia	1.0 (0.8, 1.3)	
	Malaria & Bacterial Vaginosis	Rural	Ref	0.036
		Semi-/Urban	0.3 (0.1, 0.9)	
		No anaemia	Ref	0.011
		Anaemia	2.2 (1.2, 4.1)	
Malaria & Chlamydia (reference group: negative for both)	Malaria only	Single	Ref	0.372
		Married	0.8 (0.4, 1.4)	
		No anaemia	Ref	<0.001
		Anaemia	3.1 (2.1, 4.6)	
	Chlamydia only	Single	Ref	0.524
		Married	1.2 (0.7, 2.0)	
		No anaemia	Ref	0.224
		Anaemia	1.2 (0.9, 1.8)	
	Malaria & Chlamydia	Single	Ref	0.023
		Married	0.3 (0.1, 0.9)	
		No anaemia	Ref	<0.001
		Anaemia	7.7 (2.5, 23.7)	
Malaria + Trichomoniasis (reference group: negative for both)	Malaria only	Single	Ref	0.163
		Married	0.7 (0.4, 1.2)	
		No anaemia	Ref	<0.001
		Anaemia	3.4 (2.3, 5.0)	
	Trichomoniasis only	Single	Ref	0.426
		Married	0.8 (0.5, 1.4)	
		No anaemia	Ref	0.737
		Anaemia	1.1 (0.8, 1.5)	
	Malaria & Trichomoniasis	Single	Ref	0.047
		Married	0.3 (0.1, 1.0)	
		No anaemia	Ref	0.013
		Anaemia	3.5 (1.3, 9.6)	

NB. All models control for all other variables

**Table 15: Multinomial logistic regression models for association of risk factors with malaria and bacterial vaginosis/chlamydia/trichomoniasis co-infection.**