

**Table 1** Scheffe's test for comparison of the means of proportion of women who had at least 1 ANC visit, at least 4 ANC visits during pregnancy and at least 1 ANC visit before 20 weeks of pregnancy in Ondo State, 2014-2018

Year	Proportion of women who had at least 1 ANC visit						Proportion of women who had at least 4 ANC visits						Proportion of women who had at least 1 antenatal visit before 20 weeks of pregnancy					
	Mean	sd	Min.	Max.	F	P-value	Mean	±sd	Min.	Max.	F	P-value	Mean	±sd	Min.	Max.	F	P-value
2014	35.2	14.7	17.3	71.1	-	-	25.9	18.6	3.9	71.4	-	-	32.6	9.1	15	47.6	-	-
2015	35.1	14.9	18.6	80	-0.13	1	25.9	18.9	4.3	80.1	-0.01	1	35.6	8.6	21.2	55.9	2.91	0.92
2016	35.3	11	20.1	57.4	0.15	1	16.4	6.5	3.7	29.5	-9.46	0.36	41.1	9.6	20.9	59.9	8.49	0.11
2017	39.1	14.8	18.2	84.5	3.87	0.95	19.4	7.7	7.4	36.3	-6.46	0.73	45.4	10.7	0.6	71	12.73	0.003
2018	26.8	12.1	7.7	64.8	-8.42	0.49	14	10.6	2.6	52.2	-11.84	0.15	35.9	7.1	27.3	56.4	3.21	0.89
All	34.3	13.9	7.7	84.5	1.98	0.1	20.3	14.1	2.6	80.1	2.88	0.03	38.1	10	15	71	5.63	0.0005

**Table 2** Proportions, means and analysis of variance of antenatal first visit receiving LLINs, revisits for IPT2 and anemia rate among pregnant women in Ondo State, 2014-2018

LGA	By individual LGA															
	LLIN					IPT2					Anemia rate					
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	
Akoko North East	2.1	55.4	50.9	63.9	51.1	4.7	9.7	27.5	32.1	20.7	5.6	2.3	0.31	0	39.1	
Akoko North West	19.9	83.5	102.9	96.1	87.5	13.2	40.3	43.6	38.7	26.4	11.6	10.4	7.3	6.6	4.2	
Akoko South East	9.3	79.9	87.8	85	106.9	7.1	13	31.3	34.5	31.5	10.4	3.6	2.1	18.2	2.5	
Akoko South West	0	75.8	72.1	74.9	53.1	4.6	15.9	30.4	34.2	21.8	6.1	3.5	2.8	5.3	5.9	
Akure North	18.2	103.3	77.9	87.6	74.2	17.8	19.1	21.9	21.6	21.7	4.1	14.1	5.5	1.5	1.7	
Akure South	3.8	38.2	45.3	62.9	12.6	7.9	9.6	20.4	16.7	11.1	4.5	5.9	6.5	6.2	4.9	
Ese Odo	26	50.8	46.8	82.6	65.6	22.7	69.5	94.3	57	50	11.8	14.5	14.5	0.06	0.28	
Idanre	22.4	49.9	54.4	78.6	80.5	20.3	23.4	38.1	33.7	31.8	4.2	1.6	12	0	69.4	
Ifedore	65.5	74.4	67.8	81.4	84	9.2	23.6	27	27.6	22.6	5.2	0	0.74	0	0.31	
Ilaje	47.3	84.6	89.8	85.9	60.1	66.1	56.1	53.1	54.4	61.6	4.9	5.5	0.58	0.36	9.5	
Ile-Oluji/Okeigbo	15.8	46.8	64	87.6	81.7	19.3	26.6	27.4	29.3	20.4	0.42	74.1	95.6	27.3	14.2	

Irele		2.1	74.4	69.2	92	73.5	2.2	8.8	27.9	37.1	42.6	1.7	0	1.4	1.1	0.49
Odigbo		2.3	43.3	48.1	80.8	53.1	9.1	14.2	23.7	27.6	21.5	6.5	0.26	6	5	2.7
Okitipupa		16.9	42.7	81.4	83.7	59.5	5.2	11.4	28.8	27.7	20.5	9	19.1	11.8	13.2	2.7
Ondo East		2.2	75.5	60.2	88.2	74.7	39.1	41.1	40.1	37.3	29.9	9.7	3.1	13.5	2.6	0
Ondo West		10.5	49.2	39.5	39.2	20.4	7.5	16.5	32	25.8	31.2	0.85	1.9	4.2	6.5	2.6
Ose		28	74.3	100.6	100	82.4	3.2	9.9	21.8	25.4	22.9	4.5	6.9	6.5	0.28	0.51
Owo		7	54.6	55.9	61.1	40.3	2.9	14.5	27.3	29	18.4	3.4	3.9	5.4	8.9	7.6
<b>By Ecological system</b>																
Atlantic Ocean Coastline	Mean	23.1	63.1	71.8	86.1	64.7	24.1	36.5	51	44.1	43.7	6.9	9.8	7.1	3.7	3.2
	±sd	18.9	19.6	18.7	4.2	6.5	29.5	30.9	31.1	14	17.3	4.5	8.6	7.1	6.4	4.3
Rain-forest ecosystem	Mean	17.6	61	61.4	76.7	60.4	13.6	19.9	28	27.4	23.2	4.3	5.2	7.6	5.8	4.4
	±sd	19	20.3	17.8	17.6	27.2	10.9	9.4	6.8	5.8	6.4	2.6	5.2	4.6	8.2	4.7
Savannah ecosystem	Mean	7.8	73.7	78.4	80	74.7	7.4	19.7	33.2	34.9	25.1	8.4	5	3.1	7.5	5.4
	±sd	9	12.6	22.2	13.8	27.2	4	139	7.1	2.8	4.9	3	3.7	3	7.7	2.8
F-statistics		0.8	0.66	1.29	0.55	0.49	1.15	1.52	3.29	6.7	7.01	2.68	1	1.19	0.25	0.26
P-value		0.47	0.53	0.3	0.59	0.62	0.34	0.25	0.07	0.008	0.007	0.1	0.39	0.33	0.78	0.77
<b>Overall</b>																
Mean		16.6	64.3	67.5	79.5	64.5	14.6	23.5	34.3	32.8	28.1	5.8	6.1	6.5	5.7	4.4
±sd		17.2	18.5	19.3	14.7	23.7	15.9	17.3	17.2	10.1	12.3	3.5	5.8	5	7.4	4.1
Minimum		0	38.2	39.5	39.2	12.6	2.2	8.8	20.4	16.7	11.1	0.4	0	0.3	0	0
Maximum		65.5	103.3	102.9	100	106.9	66.1	69.5	94.3	57	61.6	11.8	19.1	15.6	27.3	14.2
F-statistics		29.52					5.17					0.41				
P-value		0.00001					0.0009					0.8				

**Table 3** Annual correlation coefficient and significance level between indicators of malaria in pregnancy and proportion of women with anemia in Ondo State

Year	Observed	R <sup>2</sup>	F	P
2014	18	0.832	12.83	0.0001
2015	18	0.688	5.73	0.005

2016	18	0.774	8.927	0.0007
2017	18	0.509	2.69	0.0699
2018	18	0.663	5.111	0.0082
Overall	90	0.563	21.853	1E-06

**Table 4** Correlation coefficient outcomes between anemia rates as dependent variables and indicators of malaria in pregnancy as independent variable, relative to time on Ondo State, 2014-2018

Indicator	Correlation with anemia rate																																				
	2014					2015					2016					2017					2018					Overall											
	Coeff.	SE	t	P-value	95% CI	Coeff.	SE	t	P-value	95% CI	Coeff.	SE	t	P-value	95% CI	Coeff.	SE	t	P-value	95% CI	Coeff.	SE	t	P-value	95% CI	Coeff.	SE	t	P-value	95% CI							
Proportion of women who had at least 1 ANC visit	0.02	0.08	0.23	0.004	0.01, 0.39	-0.01	0.07	-0.11	0.26	-0.56, 0.16	0.09	0.02	0.7	0.47	-0.17, 0.09	0.21	0.05	0.6	0.53	-0.17, 0.17	0.56	0.02	0.56	0.58	1.62, 1.20	0.56	0.03	0.2	0.003	0.06, 10.6	-0.04	0.07	-0.59	0.06	0.06	0.56	0.17, 0.09

Proportion of women who had at least 4 ANC visit	-0.2857	0.022	-0.05	0.028	0.019	0.098	0.046	0.036	0.053	0.026	0.036	0.023	0.042	0.033	0.024	0.023	0.033	0.027	0.029	-0.027	0.007	-0.128	0.008	0.017	0.027	-0.021
Proportion of women who had at least 1 ANC visit before 20 weeks of pregnancy	0.126	0.064	0.046	-0.0125	0.026	0.016	0.016	0.088	-0.3237	-0.084	0.045	-0.056	0.58	-0.3822	0.321	0.047	0.1574	-0.024	0.041	-0.077	0.83	-0.323	0.036	0.23	0.032	0.024

Proportion of pregnant women who received LLINs at first ANC visit	-0.01	0.06	-0.02	0.81	-0.14	0.21	0.19	1.07	0.07	-0.02	0.13	0.09	1.07	0.07	-0.01	-0.06	0.07	-0.08	0.81	-1.56	-0.01	0.11	-0.11	0.25	-0.42	0.05	0.10	1.07	0.27	-0.11	0.05	0.10	1.07	0.27	-0.11	0.05	
Proportion of pregnant women who received IPT2 at ANC revisit	0.05	0.01	-0.09	0.91	-0.11	0.01	0.06	1.07	0.07	-0.13	0.01	0.04	1.07	0.07	-0.09	0.01	0.08	-0.07	0.91	-0.40	0.05	0.11	-0.14	0.14	-0.05	0.01	0.02	0.06	1.07	0.27	-0.11	0.05	0.10	1.07	0.27	-0.11	0.05

**Table 5** Multivariate regression analysis of association between proportion of women with anemia as dependent variable and indicators of malaria in pregnancy as independent variables relative to ecological system of Ondo State, 2014-2018

Observed	Atlantic ocean coastline			Observed	Rain-forest ecosystem			Observed	Savannah ecosystem		
	R2	F	P-value		R2	F	P-value		R2	F	P-value
4	0.6337	5.189	0.0058	10	0.561	11.5	0.000001	4	0.7465	8.834	0.0005

**Table 6** Correlation coefficient outcomes between anemia rates as dependent variables and other independent variable relative to ecological system on Ondo State, 2014-2018

Indicators of malaria in pregnancy	Atlantic ocean coastline					Rain-forest ecosystem					Savannah ecosystem				
	Coef.	S.E	t	P-value	95% CI	Coef.	S.E	t	P-value	95% CI	Coef.	S.E	t	P-value	95% CI
Proportion of women who had at least 1 ANC visit	-0.22	0.18	-1.17	0.26	-0.61, 0.18	0.03	0.09	0.37	0.72	-0.15, 0.22	-0.2	0.17	-1.16	0.26	-0.57, 0.17
Proportion of women who had at least 4 ANC visits	0.47	0.2	2.36	0.03	0.05, 0.89	-0.01	0.09	-0.1	0.92	-0.19, 0.17	0.22	0.22	1	0.33	-0.25, 0.69
Proportion of women who had at least 1 ANC visit before 20 weeks of pregnancy	0.11	0.14	0.79	0.44	-0.19, 0.41	0.08	0.07	1.12	0.27	-0.07, 0.23	0.41	0.19	2.14	0.04	0.002, 0.82
Proportion of pregnant women who received LLINs at first ANC visit	-0.04	0.05	-0.81	0.43	-0.15, 0.07	0.01	0.03	0.25	0.81	-0.05, 0.07	-0.02	0.16	-0.1	0.92	-0.36, 0.32
Proportion of pregnant women who received IPT2 at ANC revisit	0.12	0.07	1.6	0.13	-0.04, 0.27	0.04	0.11	0.33	0.74	-0.19, 0.26	-0.1	0.06	-1.54	0.15	-0.23, 0.04