

RESULTS

SOCIO-DEMOGRAPHIC CHARACTERISTICS

A total of 2378 responses were gotten from the participants out of 2379. Majority of the participants (23%) were within the age 26-33 years, the population was predominantly male (51%) and married (71%). The ethnic distribution of all the participants from the state in this study is as follows: Hausa 48.6%, Bura 9.5%, Kanuri 7.5%, Fulani 5.5%, Rukuba 4.8%, Tangale 2.1%, Nupe 1.7%, Pero 1.7%, Waja 1.7% and other minority ethnic groups. The distribution of the northern states in this study were: Borno 459 (19%), Gombe 406 (17%), Jigawa 407 (17%), Kano 473 (20%), Niger 232 (9.8%) and Plateau 401 (17%). Majority of the participants were in the urban settlements (59%), as the most dominant household size was 1-5. The 3 most common occupation in this study were: farmer (24%), trading (23%) and student (16%). Majority of the participants (29%) earn 30,000 and above, secondary education was reported to be the most common (40%) highest level of education.

The age-sex distribution in the population pyramid in figure 1 shows a population growth of a declining birth rate and a high population growth, with a low dependency ratio, where the children and elderly age group are the minority. The age structure as shown with a bulge in the middle indicates a relatively large population of middle-age, this is the youth to young adult demography.

Table 1: Socio-Demographic Characteristics

Socio-demographic Characteristic	N = 2,378
Age	
10 to 17	119 (5.0%)
18 to 25	379 (16%)
26 to 33	543 (23%)
34 to 41	522 (22%)
42 to 49	392 (16%)
50 to 57	237 (10.0%)
58 to 65	104 (4.4%)
65 and above	82 (3.4%)
Gender	
Female	973 (41%)
Male	1,405 (59%)
Settlement	
Rural	977 (41%)
Urban	1,401 (59%)
Household Size	
1 - 5	1,079 (45%)
6 - 10	854 (36%)
11 - 15	234 (9.8%)
16 and above	211 (8.9%)
Average Income/Month	
Less than 5,000	402 (17%)
5,000 to 10,000	413 (17%)
10,000 to 20,000	416 (17%)
20,000 to 30,000	466 (20%)
30,000 and above	681 (29%)
Highest Level of Education	
No schooling completed	424 (18%)
Primary education	345 (15%)
Secondary education	940 (40%)
Technical/Vocational training	263 (11%)
Bachelor's degree	283 (12%)
Master's/Professional degree	65 (2.7%)
Doctorate degree	11 (0.5%)
Others	47 (2.0%)
Marital status	
Divorced	56 (2.5%)
Married	1,694 (71%)
Single	548 (23%)
Widowed	80 (3.5%)

Table 1.2: Ethnic and State Distribution of the Participants

Variables	N= 2378	%
Ethnic group		
Hausa	1156	48.6
Bura	225	9.5
Kanuri	178	7.5
Fulani	130	5.5
Rukuba	113	4.8
Tangale	49	2.1
Nupe	41	1.7
Pero	40	1.7
Waja	40	1.7
Yoruba	39	1.6
Other	367	15.4
State		
Borno	459	19
Gombe	406	17
Jigawa	407	17
Kano	473	20
Niger	232	9.8
Plateau	401	17
Occupation		
Artisan	129	5.4
Civil servant	367	15
Farmer	569	24
House Wife	340	14
Nomad	37	1.6
Student	389	16
Traders	547	23

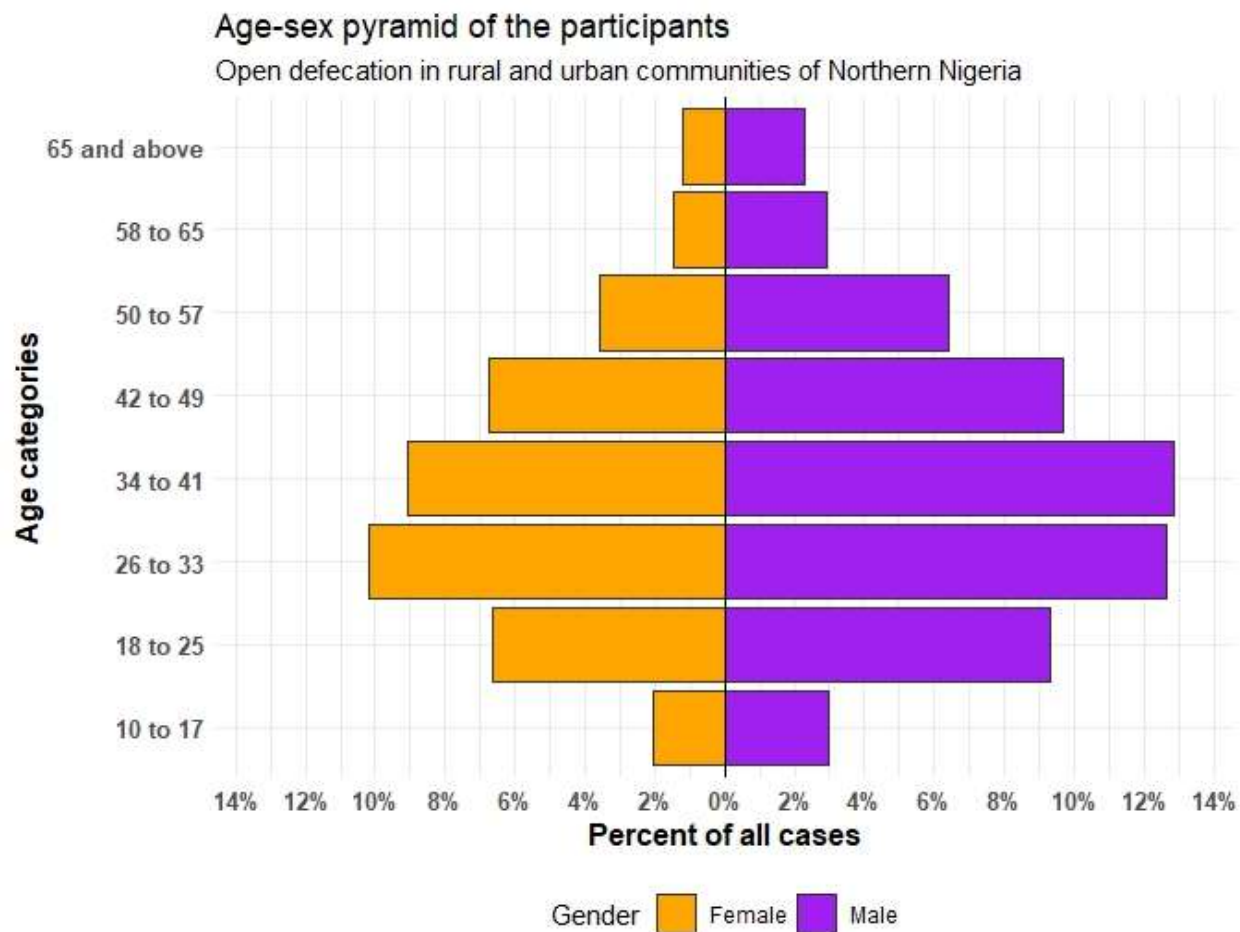


Figure 1: Population pyramid/Age-sex pyramid of the participants in this study

GEO-SPATIAL MAPPING ON RURAL AND URBAN COMMUNITIES THAT PRACTICE OPEN DEFECATION IN SELECTED STATES OF NORTHERN NIGERIA

This map uses a dot to indicate the presence of the practice of open defecation in a location. The dots show a clustering spatial pattern when viewed at a low zoomed out view. However, when the map is zoomed in an interactive plot, all the dots are separated out and seen as single elements.

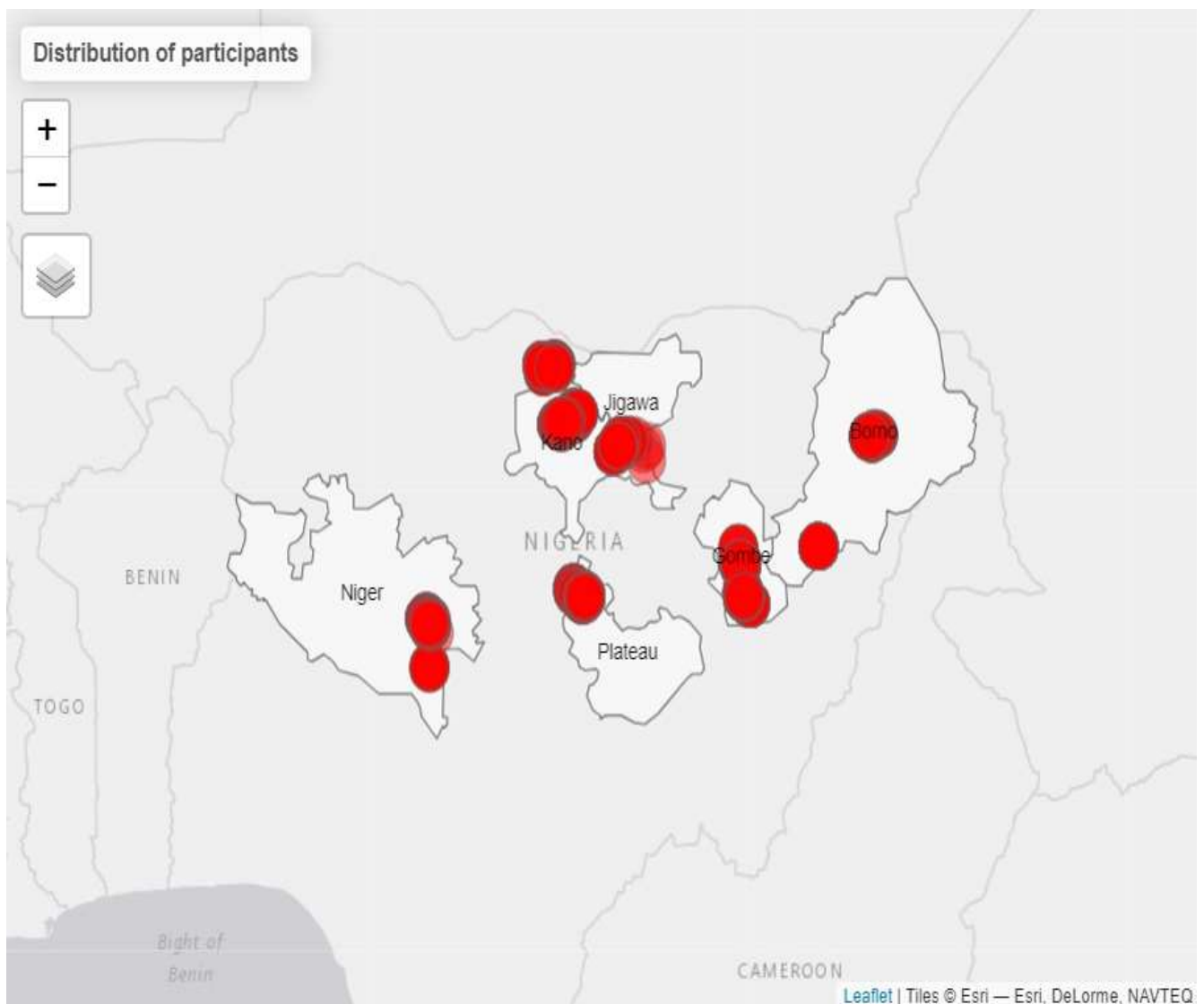


Figure 2: Geospatial representation of the practice of open defecation in the communities

FACTORS THAT ENCOURAGE OPEN DEFECATION IN THE IDENTIFIED COMMUNITIES

The factors that encourage open defecation in the identified communities were assessed. It was observed that the lack of toilet facilities was mostly common in Kano state (23.4%), poor understanding of the effect of open defecation was mostly common in Kano state (22.9%), cultural practice was most common in Kano State (31.8%), religious practice was most common in Kano state (32.6%), nonchalant attitude was common in Kano State (22.1), peer group pressure was common in Kano state (26.8%) and taboo attached to the use of toilet was most common in Gombe state (37.4%).

The chi-square test of association was used to determine the significant association between the sociodemographic factors and the factors that encourage open defecation in the identified communities. For lack of toilet facilities, the following were significantly associated: Age (<0.001), settlement (<0.001), average income (<0.001), educational level (<0.001), married status (<0.001), occupation (0.001). Multiple regression analysis was used to find the predictors of these association, it showed that age group 10-17 were 2 times likely to practice open defecation due to lack of toilets (AOR = 2.174, p-value = 0.046), rural dwellers were 2 times to practice OD (AOR = 2.026, p-value = 0.000), master's degree holder were 0.4 likely to practice OD (AOR = 0.404, p-value = 0.004), single were 2.8 times likely to practice OD (AOR = 2.841, p-value = 0.000), housewives were 3 times more likely to practice OD (AOR = 3.180, p-value < 0.001).

As for poor understanding of the effects of open defecation, the following were significantly associated: Age (<0.001), settlement (<0.001), average income (0.004), educational level (0.002), married status (<0.001), occupation (<0.001). Multiple regression analysis was used to find the predictors of these association, it showed that age group 10-17 were 2.7 times likely to practice

open defecation (AOR = 2.717, p-value = 0.008), Female were less likely (AOR = 0.650, p-value < 0.001), rural dwellers were 1.8 times to practice OD (AOR = 1.840, p-value < 0.001), 20,000 to 30,000 monthly salary were 1.5 time likely to practice OD (AOR = 1.556, p-value = 0.014), primary education degree holder were 1.8 likely to practice OD (AOR = 1.768, p-value = 0.005), single were 1.9 times likely to practice OD (AOR = 1.891, p-value = 0.031), housewives were 2.7 times more likely to practice OD (AOR = 2.686, p-value < 0.001).

As for cultural practices as a factor for open defecation, the following were significantly associated: Age (<0.001), Gender (0.003), settlement (<0.001), household size (<0.001), average income (0.004), educational level (0.001), married status (<0.001), occupation (<0.001). Multiple regression analysis was used to find the predictors of these association, it showed that age group 26-33years were 0.4 times likely to practice open defecation (AOR = 0.435, p-value = 0.006), Female were more likely (AOR = 1.700, p-value < 0.001), rural dwellers were 0.3 times likely to practice OD (AOR = 0.313, p-value < 0.001), 11-15 household size were 1.4 time more likely to practice OD (AOR = 1.424, p-value = 0.045) 10,000 to 20,000 monthly salary were 1.5 times likely to practice OD (AOR = 1.487, p-value = 0.017), No schooling completed were 2.5 likely to practice OD (AOR = 2.534, p-value <0.001), married were 0.4 times likely to practice OD (AOR = 0.469, p-value = 0.016), artisans were 5 times more likely to practice OD (AOR = 5.548, p-value < 0.001).

As for religious practices as a factor for open defecation, the following were significantly associated: Gender (0.017), settlement (<0.001), household size (0.001), average income (<0.001), educational level (<0.001), married status (0.001), occupation (<0.001). Multiple regression analysis was used to find the predictors of these association, female were 0.6 times likely (AOR = 0.646, p-value < 0.001), rural dwellers were 4.9 times likely to practice OD (AOR = 4.910, p-value

< 0.001), 5,000 to 10,000 monthly salary were 1.6 times likely to practice OD (AOR = 1.628, p-value = 0.004), the other educational level were 0.2 likely to practice OD (AOR = 0.179, p-value = 0.001), married were 2.9 times likely to practice OD (AOR = 2.889, p-value = 0.003), housewives were 2.2 times more likely to practice OD (AOR = 2.183, p-value < 0.001).

As for nonchalant attitude as a factor for open defecation, the following were significantly associated: Age (<0.001), settlement (<0.001), average income (<0.001), educational level (<0.001), married status (<0.001), occupation (<0.001). Multiple regression analysis was used to find the predictors of these association, it showed that age group 18-25years were 2.2 times likely to practice open defecation (AOR = 2.218, p-value = 0.004), rural dwellers were 1.7 times likely to practice OD (AOR = 1.772, p-value < 0.001), 5,000 to 10,000 monthly salary were 1.9 times likely to practice OD (AOR = 1.952, p-value < 0.001), No schooling completed were 0.5 likely to practice OD (AOR = 0.596, p-value = 0.005), house wives were 2.6 times more likely to practice OD (AOR = 2.633, p-value < 0.001).

As for peer pressure as a factor for open defecation, the following were significantly associated: Age (<0.001), settlement (<0.001), household size (<0.001), average income (<0.001), educational level (<0.001), married status (<0.001), occupation (<0.001). Multiple regression analysis was used to find the predictors of these association, it showed that age group 26-33years were 1.8 times likely to practice open defecation (AOR = 1.780, p-value = 0.032), female were 0.8 time likely to practice OD (AOR = 0.735, p-value = 0.002), rural dwellers were 1.4 times likely to practice OD (AOR = 1.384, p-value < 0.001), 11-15 household size were 0.6 times likely to practice OD (AOR = 0.633, p-value = 0.004), 10,000 to 20,000 monthly salary were 1.4 times likely to practice OD (AOR = 1.389, p-value = 0.036), Master degree were 0.4 likely to practice OD (AOR = 0.441, p-

value = 0.008), divorced were 2.6 times more likely to practice OD (AOR = 2.601, p-value = 0.014) house wives were 3 times more likely to practice OD (AOR = 3.021, p-value < 0.001).

As for taboo attached to toilet use as a factor for open defecation, the following were significantly associated: Age (0.048), Gender (<0.001), settlement (<0.001), household size (<0.001), average income (<0.001), educational level (<0.001), married status (<0.001), occupation (<0.001).

Multiple regression analysis was used to find the predictors of these association, it showed that female were 0.5 times likely to practice OD (AOR = 0.449, p-value < 0.001), rural dwellers were 1.2 times likely to practice OD (AOR = 1.245, p-value = 0.037), 1-5 household size were 1.3 times likely to practice OD (AOR = 1.329, p-value = 0.011), 10,000 to 20,000 monthly salary were 0.6 times likely to practice OD (AOR = 0.651, p-value = 0.012), doctorate degree were 0.2 likely to practice OD (AOR = 0.177, p-value = 0.021), nomads were 1.5 times more likely to practice OD (AOR = 1.496, p-value = 0.023).

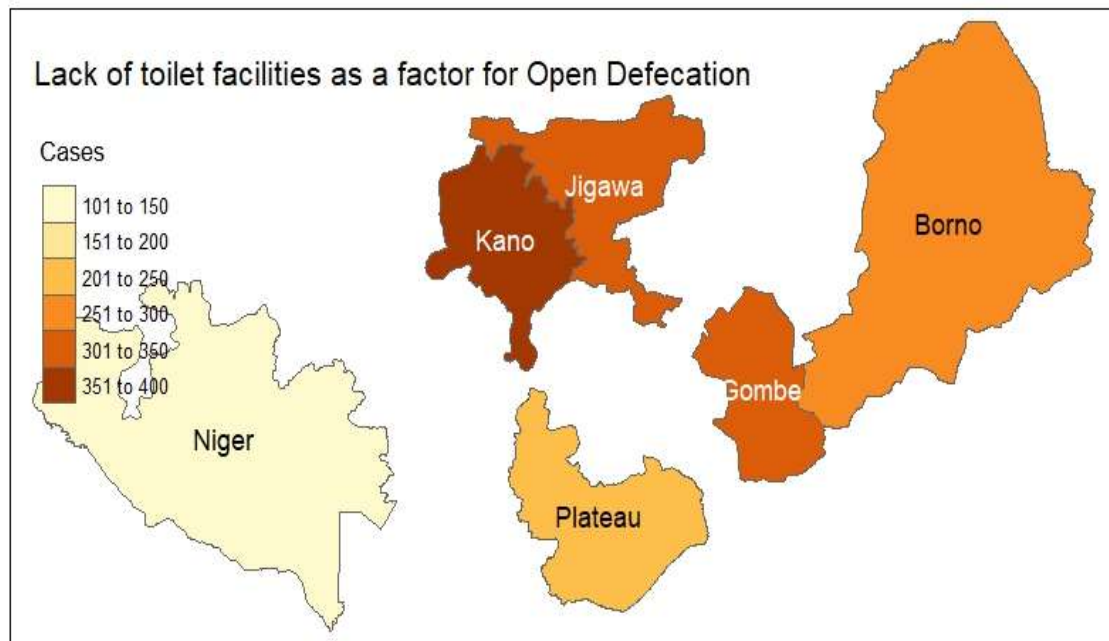


Figure 3: lack of toilet facilities

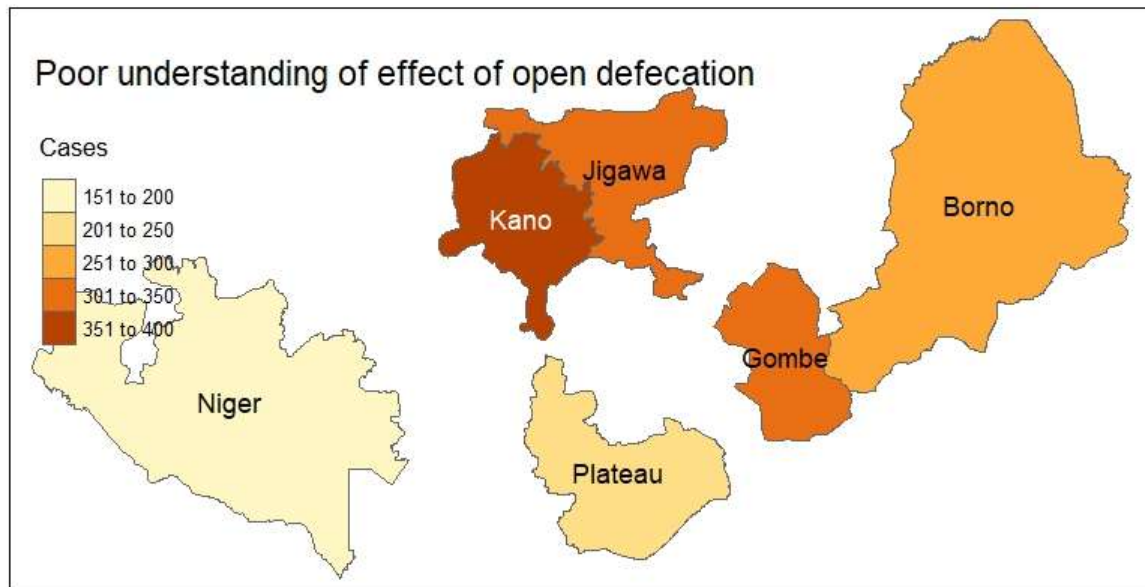


Figure 4: Poor understanding of effect of open defecation

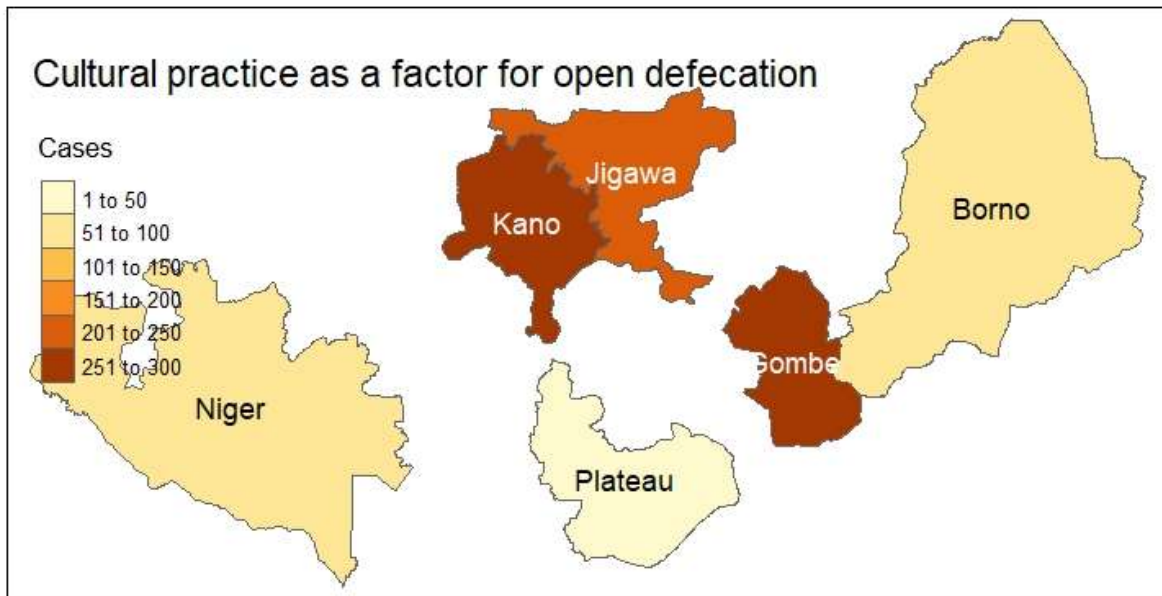


Figure 5: Cultural practices

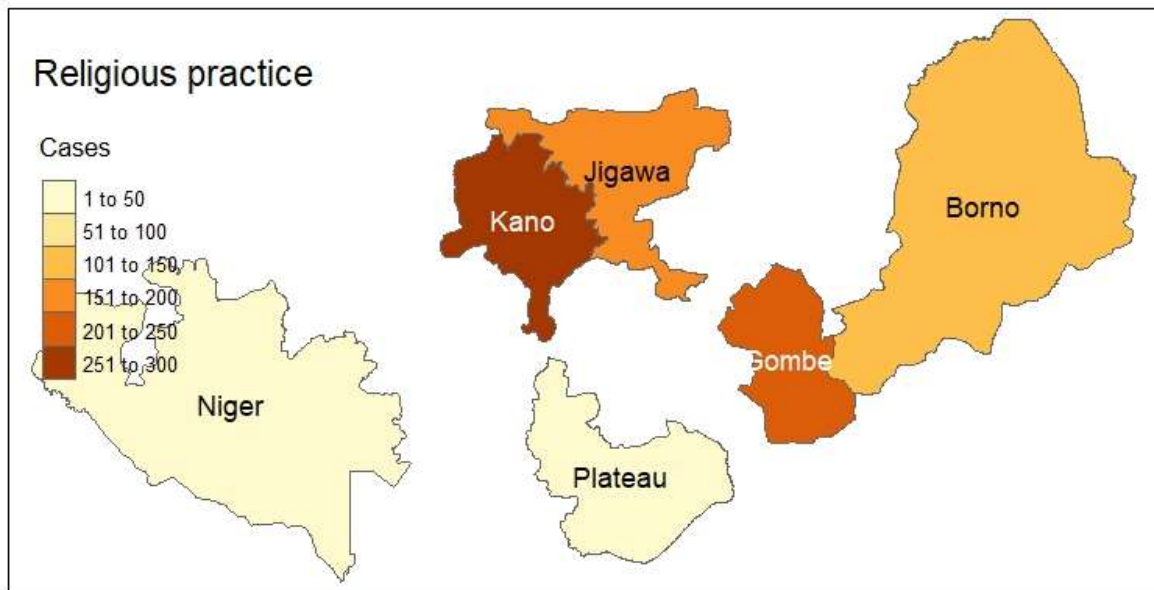


Figure 6: Religious practices

Nonchalant attitude

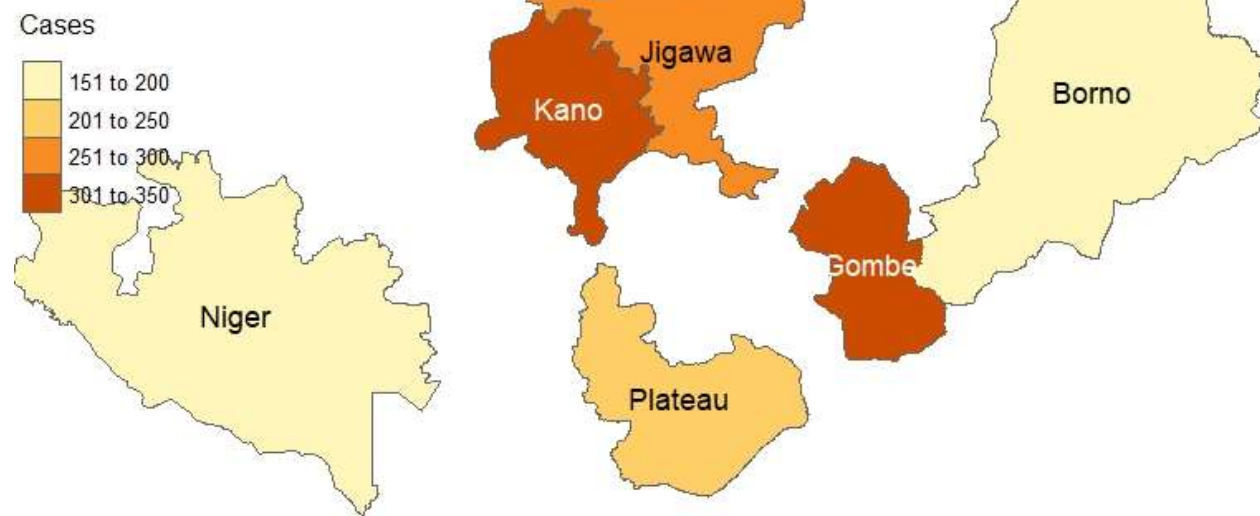


Figure 7: Nonchallant attitude

Taboo attach to the use of toilet



Figure 8: Taboo attached to the use of toilet

Table 2: factors that encourage open defecation in the identified communities

Factors	Borno	Gombe	Jigawa	Kano	Niger	Plateau	p-value
Lack of toilet facilities							<0.001
Yes	264 (15.7)	309 (18.4)	347 (20.7)	392 (23.4)	126 (7.5)	240 (14.3)	
No	195 (27.9)	97 (13.9)	60 (8.6)	81 (11.6)	106 (15.1)	161 (23.0)	
Poor understanding of effect of open defecation							<0.001
Yes	265 (15.2)	326 (18.7)	347 (19.9)	399 (22.9)	184 (10.6)	222 (12.7)	
No	194 (30.6)	80 (12.6)	60 (9.4)	74 (11.7)	48 (7.6)	179 (28.2)	
Cultural practice							<0.001
Yes	58 (6.3)	260 (28.3)	225 (24.5)	292 (31.8)	57 (6.2)	26 (2.8)	
No	401 (27.5)	146 (10.0)	182 (12.5)	181 (12.4)	175 (12.0)	375 (25.7)	
Religious practice							<0.001
Yes	111 (13.5)	249 (30.3)	163 (19.8)	268 (32.6)	25 (3.0)	7 (0.9)	
No	348 (22.4)	157 (10.1)	244 (15.7)	205 (13.2)	207 (13.3)	394 (25.3)	
Nonchalant attitude							<0.001
Yes	191 (12.5)	305 (20.0)	264 (17.3)	338 (22.1)	181 (11.8)	249 (16.3)	
No	268 (31.5)	101 (11.9)	143 (16.8)	135 (15.9)	51(6.0)	152(17.9)	
Peer group pressure							<0.001
Yes	161(13.1)	294(23.9)	197(16.0)	330(26.8)	95(7.7)	155(12.6)	
No	298(26.0)	112(9.8)	210(18.3)	143(12.5)	137(12.0)	246(21.5)	
taboo attach to the use of toilet							<0.001
Yes	90(12.8)	263(37.4)	218(31.0)	117(16.6)	10(1.4)	5(0.7)	
No	369(22.0)	143(8.5)	189(11.3)	356(21.3)	222(13.3)	396(23.6)	

Table 3a The Association between socio-demographic factors and the lack of toilet facilities

Characteristic	No N = 700	Yes N = 1,678	p-value
Age group			<0.001
10 to 17	18 (2.6%)	101 (6.0%)	
18 to 25	111 (16%)	268 (16%)	
26 to 33	155 (22%)	388 (23%)	
34 to 41	154 (22%)	368 (22%)	
42 to 49	104 (15%)	288 (17%)	
50 to 57	89 (13%)	148 (8.8%)	
58 to 65	37 (5.3%)	67 (4.0%)	
65 and above	32 (4.6%)	50 (3.0%)	
Gender			0.066
Female	307 (44%)	666 (40%)	
Male	393 (56%)	1,012 (60%)	
Settlement			<0.001
Rural	202 (29%)	775 (46%)	
Urban	498 (71%)	903 (54%)	
Household			0.8
1 - 5	318 (45%)	761 (45%)	
11 - 15	68 (9.7%)	166 (9.9%)	
16 and above	56 (8.0%)	155 (9.2%)	
6 - 10	258 (37%)	596 (36%)	
Average Income/Month			<0.001
10,000 to 20,000	113 (16%)	303 (18%)	
20,000 to 30,000	132 (19%)	334 (20%)	
30,000 and above	260 (37%)	421 (25%)	
5,000 to 10,000	96 (14%)	317 (19%)	
Less than 5,000	99 (14%)	303 (18%)	
Educational level			<0.001
Bachelor's degree	107 (15%)	176 (10%)	
Doctorate degree	2 (0.3%)	9 (0.5%)	
Master's/Professional degree	36 (5.1%)	29 (1.7%)	
No schooling completed	118 (17%)	306 (18%)	
Others	16 (2.3%)	31 (1.8%)	
Primary education	89 (13%)	256 (15%)	
Secondary education	258 (37%)	682 (41%)	
Technical/Vocational training	74 (11%)	189 (11%)	
Marital status			<0.001
Divorced	24 (3.4%)	32 (1.9%)	
Married	517 (74%)	1,177 (70%)	
Single	123 (18%)	425 (25%)	
Widowed	36 (5.1%)	44 (2.6%)	
Occupation			<0.001
Artisan	46 (6.6%)	83 (4.9%)	
Civil servant	126 (18%)	241 (14%)	
Farmer	166 (24%)	403 (24%)	
House Wife	62 (8.9%)	278 (17%)	
Nomad	9 (1.3%)	28 (1.7%)	
Student	84 (12%)	305 (18%)	
Traders	207 (30%)	340 (20%)	

Table 3b Multiple regression analysis of lack of toilet facilities as a factor for open defecation

Variables	P-value	Adjusted OR	95 CI lower	95 CI Upper
10 to 17	0.046*	2.174	1.013	4.668
18 to 25	0.736	1.103	0.625	1.946
26 to 33	0.345	1.293	0.759	2.205
34 to 41	0.190	1.421	0.840	2.402
42 to 49	0.059	1.675	0.980	2.862
50 to 57	0.748	1.095	0.631	1.899
58 to 65	0.628	1.169	0.621	2.199
65 and above		1		
Rural	0.000*	2.026	1.634	2.512
Urban		1		
10,000 to 20,000	0.611	1.094	0.774	1.545
20,000 to 30,000	0.397	1.162	0.821	1.644
30,000 and above	0.562	0.899	0.626	1.290
5,000 to 10,000	0.422	1.152	0.816	1.625
Less than 5,000		1		
Bachelor's degree	0.167	0.754	0.505	1.126
Doctorate degree	0.307	2.301	0.464	11.404
Master's/Professional degree	0.004*	0.404	0.219	0.744
No schooling completed	0.445	1.161	0.792	1.701
Others	0.798	1.095	0.547	2.193
Primary education	0.620	1.104	0.746	1.634
Secondary education	0.723	1.061	0.765	1.470
Technical/Vocational training		1		
Divorced	0.949	0.976	0.465	2.050
Married	0.038*	1.699	1.031	2.801
Single	0.000*	2.841	1.593	5.067
Widowed		1		
Artisan	0.725	1.078	0.710	1.635
Civil servant	0.002*	1.724	1.229	2.417
Farmer	0.625	1.072	0.811	1.418
House Wife	0.000*	3.180	2.211	4.575
Nomad	0.495	1.320	0.595	2.927
Student	0.047*	1.472	1.006	2.155
Traders		1		

*-significant at p.value<0.05

Table 4a The Association between socio-demographic factors and poor understanding of the effects of open defecation

Characteristic	No N = 700	Yes N = 1,678	p-value
Age group			<0.001
10 to 17	21 (3.3%)	98 (5.6%)	
18 to 25	96 (15%)	283 (16%)	
26 to 33	126 (20%)	417 (24%)	
34 to 41	137 (22%)	385 (22%)	
42 to 49	99 (16%)	293 (17%)	
50 to 57	81 (13%)	156 (9.0%)	
58 to 65	40 (6.3%)	64 (3.7%)	
65 and above	35 (5.5%)	47 (2.7%)	
Gender			0.009
Female	288 (45%)	685 (39%)	
Male	347 (55%)	1,058 (61%)	
Settlement			<0.001
Rural	195 (31%)	782 (45%)	
Urban	440 (69%)	961 (55%)	
Household			0.3
1 - 5	295 (46%)	784 (45%)	
11 - 15	60 (9.4%)	174 (10.0%)	
16 and above	66 (10%)	145 (8.3%)	
6 - 10	214 (34%)	640 (37%)	
Average Income/Month			0.004
10,000 to 20,000	105 (17%)	311 (18%)	
20,000 to 30,000	113 (18%)	353 (20%)	
30,000 and above	219 (34%)	462 (27%)	
5,000 to 10,000	95 (15%)	318 (18%)	
Less than 5,000	103 (16%)	299 (17%)	
Educational level			0.002
Bachelor's degree	83 (13%)	200 (11%)	
Doctorate degree	3 (0.5%)	8 (0.5%)	
Master's/Professional degree	30 (4.7%)	35 (2.0%)	
No schooling completed	107 (17%)	317 (18%)	
Others	17 (2.7%)	30 (1.7%)	
Primary education	72 (11%)	273 (16%)	
Secondary education	247 (39%)	693 (40%)	
Technical/Vocational training	76 (12%)	187 (11%)	
Marital status			<0.001
Divorced	18 (2.8%)	38 (2.2%)	
Married	461 (73%)	1,233 (71%)	
Single	121 (19%)	427 (24%)	
Widowed	35 (5.5%)	45 (2.6%)	
Occupation			<0.001
Artisan	40 (6.3%)	89 (5.1%)	
Civil servant	111 (17%)	256 (15%)	
Farmer	157 (25%)	412 (24%)	
House Wife	64 (10%)	276 (16%)	
Nomad	6 (0.9%)	31 (1.8%)	
Student	74 (12%)	315 (18%)	
Traders	183 (29%)	364 (21%)	

Table 4b Multiple regression analysis of poor understanding of the effect of open defecation as a factor for open defecation

Variables	P-value	Adjusted OR	95 CI lower	95 CI Upper
10 to 17	0.008*	2.717	1.297	5.693
18 to 25	0.018*	1.980	1.127	3.478
26 to 33	0.002*	2.273	1.340	3.856
34 to 41	0.008*	2.023	1.206	3.395
42 to 49	0.007*	2.056	1.215	3.481
50 to 57	0.213	1.412	0.820	2.431
58 to 65	0.663	1.147	0.619	2.126
65 and above		1		
Female	0.000*	0.650	0.526	0.805
Male		1		
Rural	0.000*	1.840	1.478	2.289
Urban		1		
10,000 to 20,000	0.177	1.271	0.897	1.799
20,000 to 30,000	0.014*	1.556	1.093	2.214
30,000 and above	0.137	1.320	0.916	1.903
5,000 to 10,000	0.229	1.235	0.876	1.741
Less than 5,000		1		
Bachelor's degree	0.455	1.169	0.776	1.761
Doctorate degree	0.559	1.521	0.373	6.207
Master's/Professional degree	0.149	0.639	0.347	1.174
No schooling completed	0.010*	1.669	1.133	2.460
Others	0.835	1.076	0.541	2.141
Primary education	0.005*	1.768	1.183	2.642
Secondary education	0.185	1.246	0.900	1.726
Technical/Vocational training		1		
Divorced	0.384	1.403	0.655	3.005
Married	0.056	1.629	0.987	2.687
Single	0.031*	1.891	1.058	3.380
Widowed		1		
Artisan	0.786	1.061	0.690	1.632
Civil servant	0.041*	1.429	1.014	2.014
Farmer	0.867	1.025	0.769	1.365
House Wife	0.000*	2.686	1.865	3.867
Nomad	0.189	1.848	0.739	4.625
Student	0.001*	1.983	1.338	2.940
Traders		1		

*-significant at p.value<0.05

Table 5a The Association between socio-demographic factors and cultural practices

Characteristic	No N = 700	Yes N = 1,678	p-value
Age group			0.001
10 to 17	63 (4.3%)	56 (6.1%)	
18 to 25	226 (15%)	153 (17%)	
26 to 33	302 (21%)	241 (26%)	
34 to 41	332 (23%)	190 (21%)	
42 to 49	249 (17%)	143 (16%)	
50 to 57	157 (11%)	80 (8.7%)	
58 to 65	69 (4.7%)	35 (3.8%)	
65 and above	62 (4.2%)	20 (2.2%)	
Gender			0.003
Female	632 (43%)	341 (37%)	
Male	828 (57%)	577 (63%)	
Settlement			<0.001
Rural	437 (30%)	540 (59%)	
Urban	1,023 (70%)	378 (41%)	
Household			<0.001
1 - 5	630 (43%)	449 (49%)	
11 - 15	169 (12%)	65 (7.1%)	
16 and above	111 (7.6%)	100 (11%)	
6 - 10	550 (38%)	304 (33%)	
Average Income/Month			<0.001
10,000 to 20,000	270 (18%)	146 (16%)	
20,000 to 30,000	303 (21%)	163 (18%)	
30,000 and above	458 (31%)	223 (24%)	
5,000 to 10,000	217 (15%)	196 (21%)	
Less than 5,000	212 (15%)	190 (21%)	
Educational level			<0.001
Bachelor's degree	192 (13%)	91 (9.9%)	
Doctorate degree	5 (0.3%)	6 (0.7%)	
Master's/Professional degree	44 (3.0%)	21 (2.3%)	
No schooling completed	290 (20%)	134 (15%)	
Others	37 (2.5%)	10 (1.1%)	
Primary education	177 (12%)	168 (18%)	
Secondary education	581 (40%)	359 (39%)	
Technical/Vocational training	134 (9.2%)	129 (14%)	
Marital status			0.001
Divorced	39 (2.7%)	17 (1.9%)	
Married	1,038 (71%)	656 (71%)	
Single	319 (22%)	229 (25%)	
Widowed	64 (4.4%)	16 (1.7%)	
Occupation			<0.001
Artisan	118 (8.1%)	11 (1.2%)	
Civil servant	254 (17%)	113 (12%)	
Farmer	318 (22%)	251 (27%)	
House Wife	165 (11%)	175 (19%)	
Nomad	18 (1.2%)	19 (2.1%)	
Student	200 (14%)	189 (21%)	
Traders	387 (27%)	160 (17%)	

Table 5b Multiple regression analysis of cultural practices as a factor for open defecation

Variables	P-value	Adjusted OR	95 CI lower	95 CI Upper
10 to 17	0.040*	0.464	0.224	0.964
18 to 25	0.068	0.559	0.300	1.043
26 to 33	0.006*	0.435	0.240	0.787
34 to 41	0.116	0.624	0.347	1.124
42 to 49	0.137	0.637	0.351	1.154
50 to 57	0.260	0.700	0.377	1.301
58 to 65	0.313	0.698	0.347	1.403
65 and above		1		
Female	0.000*	1.700	1.370	2.108
Male		1		
Rural	0.000*	0.313	0.255	0.382
Urban		1		
1- 5 ho	0.682	0.956	0.773	1.183
11-15 ho	0.045*	1.424	1.008	2.013
16 above ho	0.001*	0.557	0.396	0.781
6 10 ho		1		
10,000 to 20,000	0.017*	1.487	1.073	2.062
20,000 to 30,000	0.260	1.209	0.869	1.683
30,000 and above	0.957	1.010	0.708	1.442
5,000 to 10,000	0.617	1.083	0.793	1.480
Less than 5,000		1		
Bachelor's degree	0.072	1.446	0.968	2.162
Doctorate degree	0.342	0.526	0.139	1.980
Master's/Professional degree	0.631	1.170	0.616	2.225
No schooling completed	0.000*	2.534	1.737	3.697
Others	0.020*	2.533	1.157	5.546
Primary education	0.262	1.239	0.852	1.801
Secondary education	0.001*	1.750	1.276	2.401
Technical/Vocational training		1		
Divorced	0.418	0.698	0.292	1.668
Married	0.016*	0.469	0.253	0.870
Single	0.029*	0.467	0.236	0.925
Widowed		1		
Artisan	0.000*	5.548	2.828	10.881
Civil servant	0.729	1.064	0.750	1.508
Farmer	0.016*	0.704	0.529	0.936
House Wife	0.000*	0.309	0.219	0.435
Nomad	0.008*	0.375	0.181	0.774
Student	0.004*	0.587	0.408	0.845
Traders		1		

*-significant at p.value<0.05

Table 6a The Association between socio-demographic factors and religious practices

Characteristic	No N = 700	Yes N = 1,678	p-value
Age group			0.3
10 to 17	79 (5.1%)	40 (4.9%)	
18 to 25	249 (16%)	130 (16%)	
26 to 33	335 (22%)	208 (25%)	
34 to 41	343 (22%)	179 (22%)	
42 to 49	257 (17%)	135 (16%)	
50 to 57	159 (10%)	78 (9.5%)	
58 to 65	71 (4.6%)	33 (4.0%)	
65 and above	62 (4.0%)	20 (2.4%)	
Gender			0.017
Female	664 (43%)	309 (38%)	
Male	891 (57%)	514 (62%)	
Settlement			<0.001
Rural	431 (28%)	546 (66%)	
Urban	1,124 (72%)	277 (34%)	
Household			0.001
1 - 5	666 (43%)	413 (50%)	
11 - 15	173 (11%)	61 (7.4%)	
16 and above	140 (9.0%)	71 (8.6%)	
6 - 10	576 (37%)	278 (34%)	
Average Income/Month			<0.001
10,000 to 20,000	267 (17%)	149 (18%)	
20,000 to 30,000	334 (21%)	132 (16%)	
30,000 and above	492 (32%)	189 (23%)	
5,000 to 10,000	204 (13%)	209 (25%)	
Less than 5,000	258 (17%)	144 (17%)	
Educational level			<0.001
Bachelor's degree	211 (14%)	72 (8.7%)	
Doctorate degree	3 (0.2%)	8 (1.0%)	
Master's/Professional degree	48 (3.1%)	17 (2.1%)	
No schooling completed	327 (21%)	97 (12%)	
Others	42 (2.7%)	5 (0.6%)	
Primary education	189 (12%)	156 (19%)	
Secondary education	593 (38%)	347 (42%)	
Technical/Vocational training	142 (9.1%)	121 (15%)	
Marital status			0.001
Divorced	36 (2.3%)	20 (2.4%)	
Married	1,082 (70%)	612 (74%)	
Single	369 (24%)	179 (22%)	
Widowed	68 (4.4%)	12 (1.5%)	
Occupation			<0.001
Artisan	125 (8.0%)	4 (0.5%)	
Civil servant	260 (17%)	107 (13%)	
Farmer	330 (21%)	239 (29%)	
House Wife	187 (12%)	153 (19%)	
Nomad	31 (2.0%)	6 (0.7%)	
Student	227 (15%)	162 (20%)	
Traders	395 (25%)	152 (18%)	

Table 6b Multiple regression analysis of religious practices as a factor for open defecation

Variables	P-value	Adjusted OR	95 CI lower	95 CI Upper
Female	0.000*	0.646	0.514	0.811
Male		1		
Rural	0.000*	4.910	3.970	6.071
Urban		1		
1- 5 ho	0.611	1.061	0.845	1.331
11-15 ho	0.083	0.721	0.498	1.044
16 above ho	0.809	1.046	0.725	1.509
6 10 ho		1		
10,000 to 20,000	0.881	1.027	0.729	1.446
20,000 to 30,000	0.207	0.795	0.557	1.135
30,000 and above	0.532	1.129	0.772	1.650
5,000 to 10,000	0.004*	1.628	1.174	2.258
Less than 5,000		1		
Bachelor's degree	0.005*	0.545	0.355	0.835
Doctorate degree	0.029*	0.484	0.117	1.978
Master's/Professional degree	0.234	0.659	0.332	1.309
No schooling completed	0.000*	0.290	0.194	0.435
Others	0.001*	0.179	0.064	0.496
Primary education	0.195	0.773	0.523	1.141
Secondary education	0.020*	0.676	0.487	0.940
Technical/Vocational training		1		
Divorced	0.030*	2.763	1.102	6.930
Married	0.003*	2.889	1.446	5.771
Single	0.046*	2.178	1.013	4.681
Widowed		1		
Artisan	0.000*	0.061	0.021	0.172
Civil servant	0.578	1.110	0.768	1.604
Farmer	0.226	1.203	0.892	1.623
House Wife	0.000*	2.183	1.528	3.119
Nomad	0.060	0.400	0.154	1.041
Student	0.006*	1.744	1.176	2.585
Traders		1		

*-significant at p.value<0.05

Table 7a The Association between socio-demographic factors and nonchalant attitude

Characteristic	No N = 700	Yes N = 1,678	p-value
Age group			<0.001
10 to 17	38 (4.5%)	81 (5.3%)	
18 to 25	111 (13%)	268 (18%)	
26 to 33	167 (20%)	376 (25%)	
34 to 41	198 (23%)	324 (21%)	
42 to 49	143 (17%)	249 (16%)	
50 to 57	99 (12%)	138 (9.0%)	
58 to 65	48 (5.6%)	56 (3.7%)	
65 and above	46 (5.4%)	36 (2.4%)	
Gender			0.8
Female	351 (41%)	622 (41%)	
Male	499 (59%)	906 (59%)	
Settlement			<0.001
Rural	287 (34%)	690 (45%)	
Urban	563 (66%)	838 (55%)	
Household			0.061
1 - 5	365 (43%)	714 (47%)	
11 - 15	101 (12%)	133 (8.7%)	
16 and above	76 (8.9%)	135 (8.8%)	
6 - 10	308 (36%)	546 (36%)	
Average Income/Month			<0.001
10,000 to 20,000	154 (18%)	262 (17%)	
20,000 to 30,000	152 (18%)	314 (21%)	
30,000 and above	270 (32%)	411 (27%)	
5,000 to 10,000	112 (13%)	301 (20%)	
Less than 5,000	162 (19%)	240 (16%)	
Educational level			<0.001
Bachelor's degree	92 (11%)	191 (13%)	
Doctorate degree	3 (0.4%)	8 (0.5%)	
Master's/Professional degree	29 (3.4%)	36 (2.4%)	
No schooling completed	206 (24%)	218 (14%)	
Others	15 (1.8%)	32 (2.1%)	
Primary education	118 (14%)	227 (15%)	
Secondary education	305 (36%)	635 (42%)	
Technical/Vocational training	82 (9.6%)	181 (12%)	
Marital status			<0.001
Divorced	19 (2.2%)	37 (2.4%)	
Married	623 (73%)	1,071 (70%)	
Single	165 (19%)	383 (25%)	
Widowed	43 (5.1%)	37 (2.4%)	
Occupation			<0.001
Artisan	57 (6.7%)	72 (4.7%)	
Civil servant	127 (15%)	240 (16%)	
Farmer	232 (27%)	337 (22%)	
House Wife	86 (10%)	254 (17%)	
Nomad	21 (2.5%)	16 (1.0%)	
Student	102 (12%)	287 (19%)	
Traders	225 (26%)	322 (21%)	

Table 7b Multiple regression analysis of nonchallant attitude as a factor for open defecation

Variables	P-value	Adjusted OR	95 CI lower	95 CI Upper
10 to 17	0.027*	2.149	1.092	4.227
18 to 25	0.004*	2.218	1.280	3.843
26 to 33	0.004*	2.125	1.270	3.555
34 to 41	0.043*	1.684	1.017	2.789
42 to 49	0.029*	1.771	1.062	2.953
50 to 57	0.103	1.560	0.915	2.659
58 to 65	0.303	1.374	0.750	2.517
65 and above		1		
Rural	0.000*	1.772	1.450	2.166
Urban		1		
1- 5 ho	0.160	0.863	0.702	1.060
11-15 ho	0.206	0.820	0.603	1.115
16 above ho	0.363	1.168	0.836	1.634
6 10 ho		1		
10,000 to 20,000	0.022*	1.447	1.055	1.985
20,000 to 30,000	0.000*	1.856	1.415	2.706
30,000 and above	0.012*	1.548	1.101	2.175
5,000 to 10,000	0.000*	1.952	1.420	2.684
Less than 5,000		1		
Bachelor's degree	0.540	1.132	0.761	1.686
Doctorate degree	0.506	1.604	0.398	6.464
Master's/Professional degree	0.372	0.761	0.418	1.387
No schooling completed	0.005*	0.596	0.416	0.855
Others	0.333	1.411	0.702	2.837
Primary education	0.843	0.963	0.665	1.396
Secondary education	0.811	0.962	0.702	1.318
Technical/Vocational training		1		
Divorced	0.120	1.819	0.856	3.868
Married	0.131	1.468	0.892	2.416
Single	0.060	1.728	0.978	3.054
Widowed		1		
Artisan	0.354	0.827	0.554	1.236
Civil servant	0.137	1.281	0.925	1.776
Farmer	0.790	0.964	0.737	1.261
House Wife	0.000*	2.633	1.872	3.704
Nomad	0.091	0.547	0.272	1.101
Student	0.011*	1.613	1.118	2.326
Traders		1		

*-significant at p.value<0.05

Table 8a The Association between socio-demographic factors and peer group pressure

Characteristic	No N = 700	Yes N = 1,678	p-value
Age group			<0.001
10 to 17	55 (4.8%)	64 (5.2%)	
18 to 25	176 (15%)	203 (16%)	
26 to 33	231 (20%)	312 (25%)	
34 to 41	243 (21%)	279 (23%)	
42 to 49	186 (16%)	206 (17%)	
50 to 57	131 (11%)	106 (8.6%)	
58 to 65	69 (6.0%)	35 (2.8%)	
65 and above	55 (4.8%)	27 (2.2%)	
Gender			0.8
Female	472 (41%)	501 (41%)	
Male	674 (59%)	731 (59%)	
Settlement			<0.001
Rural	413 (36%)	564 (46%)	
Urban	733 (64%)	668 (54%)	
Household			<0.001
1 - 5	470 (41%)	609 (49%)	
11 - 15	145 (13%)	89 (7.2%)	
16 and above	107 (9.3%)	104 (8.4%)	
6 - 10	424 (37%)	430 (35%)	
Average Income/Month			<0.001
10,000 to 20,000	187 (16%)	229 (19%)	
20,000 to 30,000	218 (19%)	248 (20%)	
30,000 and above	371 (32%)	310 (25%)	
5,000 to 10,000	171 (15%)	242 (20%)	
Less than 5,000	199 (17%)	203 (16%)	
Educational level			<0.001
Bachelor's degree	148 (13%)	135 (11%)	
Doctorate degree	6 (0.5%)	5 (0.4%)	
Master's/Professional degree	41 (3.6%)	24 (1.9%)	
No schooling completed	250 (22%)	174 (14%)	
Others	26 (2.3%)	21 (1.7%)	
Primary education	144 (13%)	201 (16%)	
Secondary education	426 (37%)	514 (42%)	
Technical/Vocational training	105 (9.2%)	158 (13%)	
Marital status			<0.001
Divorced	20 (1.7%)	36 (2.9%)	
Married	826 (72%)	868 (70%)	
Single	247 (22%)	301 (24%)	
Widowed	53 (4.6%)	27 (2.2%)	
Occupation			<0.001
Artisan	75 (6.5%)	54 (4.4%)	
Civil servant	176 (15%)	191 (16%)	
Farmer	297 (26%)	272 (22%)	
House Wife	112 (9.8%)	228 (19%)	
Nomad	23 (2.0%)	14 (1.1%)	
Student	160 (14%)	229 (19%)	
Traders	303 (26%)	244 (20%)	

Table 8b Multiple regression analysis of peer group pressure as a factor for open defecation

Variables	P-value	Adjusted OR	95 CI lower	95 CI Upper
10 to 17	0.271	1.455	0.746	2.835
18 to 25	0.185	1.457	0.836	2.541
26 to 33	0.032*	1.780	1.051	3.015
34 to 41	0.049*	1.687	1.003	2.838
42 to 49	0.040*	1.737	1.026	2.939
50 to 57	0.260	1.372	0.792	2.377
58 to 65	0.771	0.910	0.482	1.717
65 and above		1		
Female	0.002*	0.735	0.606	0.891
Male		1		
Rural	0.001*	1.384	1.146	1.673
Urban		1		
1- 5 ho	0.332	1.102	0.906	1.342
11-15 ho	0.004*	0.633	0.466	0.862
16 above ho	0.579	1.095	0.795	1.509
6 10 ho		1		
10,000 to 20,000	0.036*	1.389	1.022	1.888
20,000 to 30,000	0.052	1.361	0.998	1.856
30,000 and above	0.407	1.151	0.826	1.602
5,000 to 10,000	0.026	1.405	1.042	1.894
Less than 5,000		1		
Bachelor's degree	0.018*	0.634	0.435	0.924
Doctorate degree	0.396	0.579	0.163	2.048
Master's/Professional degree	0.008*	0.441	0.240	0.807
No schooling completed	0.001*	0.562	0.396	0.797
Others	0.227	0.669	0.348	1.285
Primary education	0.853	1.034	0.726	1.474
Secondary education	0.228	0.833	0.618	1.121
Technical/Vocational training		1		
Divorced	0.014*	2.601	1.215	5.568
Married	0.079	1.587	0.947	2.658
Single	0.062	1.731	0.972	3.083
Widowed		1		
Artisan	0.439	0.853	0.571	1.276
Civil servant	0.001*	1.689	1.230	2.321
Farmer	0.539	1.086	0.835	1.412
House Wife	0.000*	3.021	2.186	4.174
Nomad	0.531	0.796	0.390	1.625
Student	0.005*	1.627	1.158	2.286
Traders		1		

*-significant at p.value<0.05

Table 9a The Association between socio-demographic factors and taboo attach to the use of toilet

Characteristic	No N = 700	Yes N = 1,678	p-value
Age group			0.048
10 to 17	79 (4.7%)	40 (5.7%)	
18 to 25	250 (15%)	129 (18%)	
26 to 33	367 (22%)	176 (25%)	
34 to 41	372 (22%)	150 (21%)	
42 to 49	288 (17%)	104 (15%)	
50 to 57	182 (11%)	55 (7.8%)	
58 to 65	76 (4.5%)	28 (4.0%)	
65 and above	61 (3.6%)	21 (3.0%)	
Gender			<0.001
Female	767 (46%)	206 (29%)	
Male	908 (54%)	497 (71%)	
Settlement			<0.001
Rural	641 (38%)	336 (48%)	
Urban	1,034 (62%)	367 (52%)	
Household			<0.001
1 - 5	716 (43%)	363 (52%)	
11 - 15	173 (10%)	61 (8.7%)	
16 and above	143 (8.5%)	68 (9.7%)	
6 - 10	643 (38%)	211 (30%)	
Average Income/Month			<0.001
10,000 to 20,000	312 (19%)	104 (15%)	
20,000 to 30,000	339 (20%)	127 (18%)	
30,000 and above	507 (30%)	174 (25%)	
5,000 to 10,000	251 (15%)	162 (23%)	
Less than 5,000	266 (16%)	136 (19%)	
Educational level			<0.001
Bachelor's degree	201 (12%)	82 (12%)	
Doctorate degree	4 (0.2%)	7 (1.0%)	
Master's/Professional degree	48 (2.9%)	17 (2.4%)	
No schooling completed	320 (19%)	104 (15%)	
Others	41 (2.4%)	6 (0.9%)	
Primary education	213 (13%)	132 (19%)	
Secondary education	654 (39%)	286 (41%)	
Technical/Vocational training	194 (12%)	69 (9.8%)	
Marital status			<0.001
Divorced	41 (2.4%)	15 (2.1%)	
Married	1,208 (72%)	486 (69%)	
Single	357 (21%)	191 (27%)	
Widowed	69 (4.1%)	11 (1.6%)	
Occupation			<0.001
Artisan	117 (7.0%)	12 (1.7%)	
Civil servant	251 (15%)	116 (17%)	
Farmer	378 (23%)	191 (27%)	
House Wife	251 (15%)	89 (13%)	
Nomad	28 (1.7%)	9 (1.3%)	
Student	242 (14%)	147 (21%)	
Traders	408 (24%)	139 (20%)	

Table 9b Multiple regression analysis of taboo attached to toilet as a factor for open defecation

Variables	P-value	Adjusted OR	95 CI lower	95 CI Upper
10 to 17	0.471	0.766	0.372	1.580
18 to 25	0.985	1.006	0.547	1.850
26 to 33	0.820	1.069	0.599	1.908
34 to 41	0.977	0.991	0.560	1.757
42 to 49	0.760	0.913	0.511	1.633
50 to 57	0.367	0.755	0.409	1.392
58 to 65	0.843	0.933	0.467	1.864
65 and above		1		
Female	0.000*	0.449	0.359	0.562
Male		1		
Rural	0.037*	1.245	1.013	1.530
Urban		1		
1- 5 ho	0.011*	1.329	1.068	1.653
11-15 ho	0.933	1.015	0.719	1.432
16 above ho	0.154	1.289	0.909	1.827
6 10 ho		1		
10,000 to 20,000	0.012*	0.651	0.466	0.910
20,000 to 30,000	0.211	0.807	0.578	1.129
30,000 and above	0.041*	0.685	0.476	0.984
5,000 to 10,000	0.298	1.179	0.865	1.605
Less than 5,000		1		
Bachelor's degree	0.957	1.011	0.667	1.534
Doctorate degree	0.021*	0.177	0.266	1.057
Master's/Professional degree	0.825	0.928	0.476	1.807
No schooling completed	0.434	0.855	0.577	1.267
Others	0.034*	0.366	0.145	0.925
Primary education	0.054	1.457	0.993	2.137
Secondary education	0.543	1.108	0.796	1.542
Technical/Vocational training		1		
Divorced	0.248	1.703	0.690	4.204
Married	0.096	1.776	0.903	3.493
Single	0.076	1.941	0.933	4.041
Widowed		1		
Artisan	0.000*	0.298	0.158	0.562
Civil servant	0.819*	0.960	1.057	1.917
Farmer	0.115	1.262	0.945	1.685
House Wife	0.057	1.415	0.990	2.025
Nomad	0.023*	1.496	0.407	2.034
Student	0.162	1.298	0.900	1.872
Traders		1		

*-significant at p.value<0.05

PERCEIVED HEALTH EFFECTS OF OPEN DEFECATION AMONG COMMUNITY MEMBERS

Majority of the participants claimed they agree that the following are the perceived health effects of open defecation among the community members: Diarrhoeal disease (51.9%), death (48.7%), malnutrition (49.4%), respiratory infections (56.1%), worm infection (50.9%), typhoid fever (49.2%), hepatitis (42.8%), trachoma (38.6%), schistosomiasis (47.0%), violence of women/sexual assault (45.5%), psychological trauma (48.2%), stunted growth (46.3%), mental health (42.2%), physical alertness (46.7%), pneumonia (42.2%) and anaemia (44.8%). Figure 3 shows the distribution of the perceived health effects of open defecation by states

Table 3: Perceived health effects of open defecation among community members

Variables	SD%	D%	U%	A%	SA%
Diarrhoeal disease	0.5	6.7	3.1	51.9	37.8
Death	2.9	12.0	10.6	48.7	25.8
Malnutrition	1.6	15.1	11.3	49.4	22.6
Respiratory infections	1.1	12.0	10.2	56.1	12.0
Worm infection	1.2	13.2	8.8	50.9	25.9
Typhoid fever	0.7	11.9	6.2	49.2	31.9
Hepatitis	2.1	19.5	16.6	42.8	19.0
Trachoma	3.4	24.3	23.4	38.6	10.3
Schistosomiasis	3.6	20.6	16.4	47.0	12.4
Violence of women/ Sexual Assault	3.0	18.3	9.8	45.5	18.3
Psychological trauma	2.8	19.7	17.5	48.2	19.7
Stunted growth	3.1	23.8	16.5	46.3	10.3
Mental health challenge	2.9	27.8	14.7	42.2	12.4
Physical alertness	1.8	24.1	14.9	46.7	12.5
Pneumonia	3.0	22.2	20.8	42.2	11.8
Anaemia	2.1	26.1	16.3	44.8	10.8

SD- strongly disagree, D- disagree, U- Undecided, A- Agree, SA- Strongly agree

Perceived Health Effects of Open Defecation n = 2378

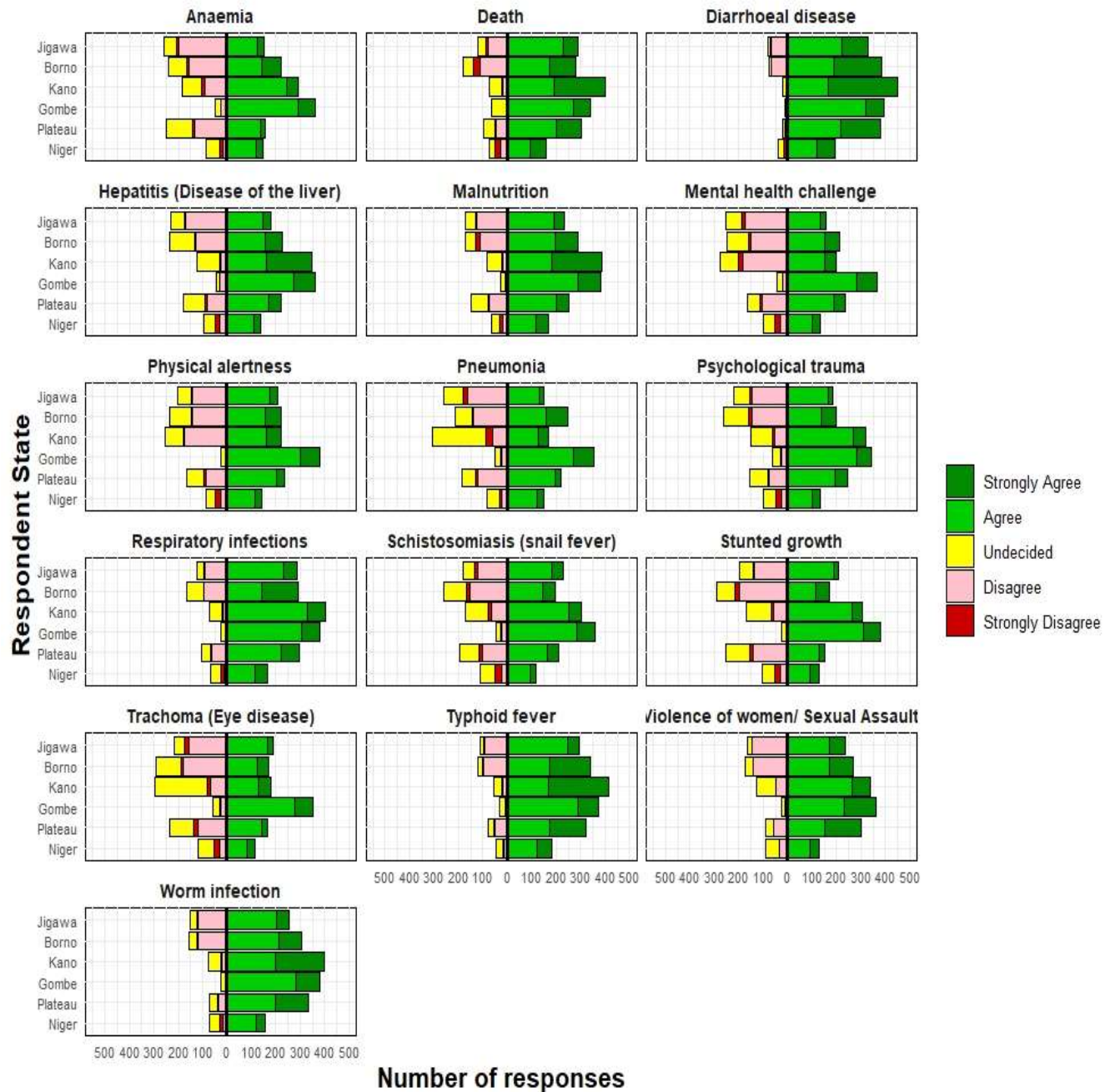


Figure 3: The distribution of the perceived health effects of open defecation by states