

## Online Supporting Material

Supplemental Table 1. Demographic and other characteristics of non-pregnant women of childbearing-age, Belize National Micronutrient Survey 2011 and Belize 2010 Census

Indicator	Belize Micronutrient National Survey			Belize census 2010	
	n (unweighted)	n (weighted)	Weighted % (95% CI)	N	Percent
<b>Area</b>					
Rural	559	40680	51.1 (43.8, 58.6)	44108	51.9
Urban	378	38987	48.9 (41.4, 56.3)	40820	48.1
<b>Ethnicity</b>					
Mayan	139	9832	12.3 (9.3, 16.1)	8578	9.5
Mestizo	468	42446	53.2 (47.7, 58.6)	42379	50.5
Black (Creole and Garifuna)	258	20881	26.3 (21.8, 31.3)	25054	31.1
Other	72	6508	8.2 (5.7, 11.7)	8917	8.0
<b>Age (y)<sup>1</sup></b>					
15—19	140	16225	20.4 (16.8, 24.5)	17327	20.4
20—29	335	26344	33.1 (29.5, 36.9)	29215	34.4
30—39	297	21284	26.7 (23.6, 30.0)	22337	26.3
40—49	165	15814	19.8 (16.6, 23.5)	16051	18.9
<b>Education (y)</b>					
< 6	38	2612	3.5 (2.2, 4.9)	3305	19.8
6—11	423	35071	44.8 (39.4, 48.6)	11105	12.8
7—12	328	29501	37.8 (32.6, 41.7)	58583	52.6
> 12	127	10502	13.9 (10.2, 16.8)	12025	14.8
<b>Region</b>					
Central	223	25957	32.6 (28.7, 36.7)	26934	31.7
North	208	20963	26.3 (23.2, 29.6)	23105	27.2
South	243	14114	17.7 (15.4, 20.3)	15492	18.2
West	263	18633	23.4 (20.8, 26.1)	19398	22.9

<sup>1</sup> Census reported different categories than BNMS. Age categories were modified to match census

**Supplemental Table 2. Serum and red blood cell folate and plasma vitamin B-12 percentile and geometric means concentrations by selected characteristics and region for non-pregnant women of childbearing-age, Belize 2011**

Characteristic	Percentile							Geometric Mean
	5th	10th	25th	50th	75th	90th	95th	
<b>Serum Folate (nmol/L)</b>								
<b>Area</b>								
Rural	10	13	19	29	41	52	60	28
Urban	11	14	21	28	40	52	61	28
<b>Ethnicity</b>								
Mayan	9	11	15	24	36	46	61	20
Mestizo	14	17	24	34	45	58	70	30
Creole/Garifuna	14	16	21	29	40	53	64	26
Other	14	16	24	37	49	62	73	35
<b>Age (Yrs.)</b>								
15 – 24	11	14	21	29	40	46	61	28
25 – 34	9	12	18	26	39	52	56	26
35 – 49	11	13	21	30	44	55	66	29
<b>Family Income (BLZ\$)</b>								
Don't Know	13	15	21	30	44	62	79	28
≤ 699	11	14	21	32	45	57	76	26
700-1399	15	17	25	36	47	56	63	27
> 1399	13	15	21	27	37	49	55	30
<b>Health Services Use</b>								
Private	15	19	25	37	48	63	71	29
Private/Public	16	19	26	37	48	54	64	29
Public	10	13	19	27	40	53	61	27
Other	14	18	27	36	44	51	59	28
<b>Use of Folic Acid Containing Supplements</b>								
No	12	14	21	30	42	53	63	26
Yes	15	17	23	34	45	60	76	29
<b>Region</b>								
Central	11	13	19	27	40	53	60	27
North	16	18	25	35	45	55	63	34
South	9	11	16	24	35	45	47	23
West	10	13	19	26	39	54	66	27
<b>Red Blood Cell Folate (nmol/L)</b>								
<b>Area</b>								
Rural	307	398	543	746	992	1244	1486	723
Urban	285	380	569	744	976	1266	1418	715
<b>Ethnicity</b>								
Mayan	273	330	406	589	767	947	1047	571
Mestizo	298	405	576	765	999	1264	1408	738
Creole/Garifuna	308	380	569	719	985	1242	1418	715
Other	-	450	611	887	1173	1636	1841	881
<b>Age (y)</b>								
15 – 24	276	371	540	675	897	1212	1344	675
25 – 34	310	384	547	751	990	1267	1486	727
35 – 49	335	430	582	792	1034	1314	1475	767

Online Supporting Material

**Family Income (BLZ\$)**

Don't Know	285	344	559	750	964	1181	1374	708
≤ 699	297	380	528	733	956	1243	1416	704
700-1399	301	390	568	724	1040	1289	1507	732
> 1399	312	449	569	762	1002	1305	1385	738

**Health Services Use**

Private	276	386	564	772	1122	1286	1483	756
Private/Public	368	433	568	692	872	1046	1289	693
Public	312	449	569	762	1002	1305	1385	720
Other	236	296	553	755	990	1342	1356	697

**Use of Folic Acid Containing Supplements**

No	282	375	559	757	958	1261	1415	714
Yes	314	400	547	718	1018	1252	1491	726

**Region**

Central	274	376	572	743	971	1262	1418	719
North	409	510	631	840	1130	1396	1538	837
South	297	386	473	677	846	1045	1152	639
West	281	345	494	704	913	1089	1399	664

**Serum Vitamin B-12 (pmol/L)**

**Area**

Rural	108	125	167	215	305	425	539	263
Urban	118	140	176	226	319	442	542	319

**Ethnicity**

Mayan	106	125	165	211	284	382	456	287
Mestizo	109	125	163	200	288	429	525	323
Creole/Garifuna	115	137	194	253	352	441	547	245
Other	142	150	187	260	336	434	571	248

**Age (y)**

15 — 24	113	126	172	224	313	415	495	266
25 — 34	115	131	174	222	293	395	443	273
35 — 49	109	133	166	218	328	498	621	319

**Family Income (BLZ\$)**

Don't Know	115	126	169	224	312	426	510	342
≤ 699	110	125	169	216	324	457	545	219
700-1399	121	134	170	215	300	418	490	241
> 1399	102	132	174	221	305	416	533	292

**Health Services Use**

Private	125	139	181	260	391	545	702	269
Private/Public	131	150	187	218	290	445	607	240
Public	114	126	165	220	304	413	490	287
Other	101	115	176	199	297	369	511	361

**Use of Folic Acid Containing Supplements**

No	103	124	163	207	288	412	487	282
Yes	122	141	186	237	343	470	605	288

**Region**

Central	116	144	189	235	333	449	543	286
North	103	123	159	196	270	366	494	285
South	124	144	176	241	331	435	528	268
West	107	121	150	217	324	425	520	338

1 Too few observations to allow estimation



**Supplemental Table 3. National and regional adjusted<sup>1,2</sup> geometric means of serum folate concentrations by socio-demographic characteristics and regions for non-pregnant women of childbearing-age, Belize 2011**

Characteristics	n (unweighted)	Serum Folate (95% CI) (nmol/L)
<b>National</b>	937	28 (26, 29)
<b>Area</b>		
Rural	559	28 (26, 29)
Urban	378	27 (25, 29)
<b>Ethnicity<sup>1</sup></b>		
Maya	139	21 <sup>3,4,5</sup> (18, 24)
Mestizo	468	29 <sup>6</sup> (27, 31)
Creole/Garifuna	258	27 <sup>7</sup> (25, 29)
Other	72	34 (30, 39)
<b>Age (y)</b>		
15 – 24	294	28 <sup>8</sup> (26, 30)
25 – 34	343	25 <sup>9</sup> (24, 27)
35 – 49	300	29 (27, 31)
<b>Education (y)</b>		
< 6	233	26 <sup>10</sup> (24, 28)
6—11	354	28 (27, 30)
12	223	27 (24, 28)
> 12	127	30 (27, 31)
<b>Family Income (BLZ\$)</b>		
Don't Know	207	26 (23, 29)
≤ 699	290	28 (26, 30)
700–1399	248	29 <sup>11</sup> (27, 32)
> 1399	191	26 (24, 29)
<b>Health Services Use</b>		
Private	125	28 (25, 31)
Private/Public	100	27 (25, 30)
Public	635	28 (26, 29)
Other	77	29 (25, 32)
<b>Use of Folic Acid Containing Supplements</b>		
No	538	27 (25, 28)
Yes	399	29 (27, 31)
<b>Region</b>		
Central	208	27 <sup>12</sup> (24, 29)
North	223	31 <sup>13,14</sup> (29, 33)
South	243	26 (23, 28)
West	263	27 (25, 29)

1 Adjusted for area, ethnicity, age, education, income, health services use, use of folic acid containing supplements and region and region

2 all pair-wise comparisons were made

3 Maya vs. Mestizo p< 0.05

4 Ethnicity: Maya vs. Creole/Garifuna p<0.05

5 Maya vs Other p<0.05

6 Mestizo vs Other p<0.01

7 Creole/Garifuna vs. Other p< 0.05

8 15-24 vs 25-34 p<0.05

9 15-24 vs 35-49 p<0.01

10 <6 vs. 12+ p<0.05

## Online Supporting Material

11 700-1399 vs.  $\geq 1400$  BLZ\$  $p < 0.05$

12 Central vs. North  $p < 0.01$

13 North vs South  $p < 0.01$

14 North vs. West  $p < 0.05$

**Supplemental Table 4. Adjusted geometric means of red blood cell (RBC) folate concentrations (nmol/L) by plasma vitamin B-12 status and selected characteristics in non-pregnant women of reproductive age, Belize 2011**

Characteristics	n (unweighted)	Geometric Mean (95% CI) <sup>1</sup> (nmol/L)	Linear Trend Test P-value	Slope <sup>2</sup> +/-
<b>Vitamin B-12 status</b>			<0.001	+
Deficient	153	610 (537, 693)		
Marginally deficient	294	641 (591, 695)		
Normal	483	783 (732, 837)		
<b>Area</b>				
<b>Rural</b>			0.001	+
<b>Vitamin B-12 status</b>				
Deficient	96	642 (569, 724)		
Marginally deficient	171	687 (625, 755)		
Normal	290	778 (713, 849)		
<b>Urban</b>			0.018	+
<b>Vitamin B-12 status</b>				
Deficient	57	588 (457, 756)		
Marginally deficient	123	598 (524, 683)		
Normal	193	783 (706, 869)		
<b>Ethnicity</b>				
<b>Mayan</b>			0.099	+
<b>Vitamin B-12 status</b>				
Deficient	29	518 (391, 687)		
Marginally deficient	42	516 (401, 663)		
Normal	68	628 (494, 798)		
<b>Mestizo</b>			<0.001	+
<b>Vitamin B-12 status</b>				
Deficient	87	602 (520, 698)		
Marginally deficient	167	662 (599, 731)		
Normal	209	802 (734, 875)		
<b>Creole/Garifuna</b>			0.251	+
<b>Vitamin B-12 status</b>				
Deficient	29	671 (520, 865)		
Marginally deficient	67	613 (510, 736)		
Normal	160	782 (689, 888)		
<b>Other</b>			0.446	+
<b>Vitamin B-12 status</b>				
Deficient	8	792 (598, 1050)		
Marginally deficient	18	682 (512, 908)		
Normal	46	886 (751, 1046)		
<b>Age (yrs.)</b>				
<b>15—24</b>			0.074	+
<b>Vitamin B-12 status</b>				
Deficient	22	610 (478, 780)		
Marginally deficient	40	633 (541, 742)		
Normal	77	748 (665, 840)		
<b>25—34</b>			<0.001	+
<b>Vitamin B-12 status</b>				
Deficient	75	570 (488, 666)		
Marginally deficient	164	632 (553, 723)		
Normal	253	784 (706, 871)		
<b>35—49</b>			0.009	+
<b>Vitamin B-12 status</b>				
Deficient	56	611 (507, 737)		
Marginally deficient	90	647 (562, 746)		

Online Supporting Material

Normal	153	774 (694, 863)		
<b>Education (y)</b>				
<b>&lt; 6</b>				
<b>Vitamin B-12 status</b>			0.032	+
Deficient	44	720 (609, 855)		
Marginally deficient	76	677 (580, 789)		
Normal	112	852 (751, 966)		
<b>6—11</b>				
<b>Vitamin B-12 status</b>			<0.001	+
Deficient	62	581 (500, 675)		
Marginally deficient	106	642 (574, 719)		
Normal	183	808 (723, 902)		
<b>12</b>				
<b>Vitamin B-12 status</b>			0.083	+
Deficient	36	598 (480, 745)		
Marginally deficient	71	709 (612, 821)		
Normal	113	734 (644, 836)		
<b>&gt; 12</b>				
<b>Vitamin B-12 status</b>			0.974	+
Deficient	11	652 (471, 904)		
Marginally deficient	41	508 (380, 678)		
Normal	75	656 (536, 803)		
<b>Family Income (BLZ\$)</b>				
<b>Don't Know</b>				
<b>Vitamin B-12 status</b>			0.005	+
Deficient	35	564 (440, 724)		
Marginally deficient	67	655 (551, 777)		
Normal	100	801 (705, 910)		
<b>≤699</b>				
<b>Vitamin B-12 status</b>			0.025	+
Deficient	54	625 (533, 733)		
Marginally deficient	89	623 (545, 712)		
Normal	147	785 (707, 872)		
<b>700-1399</b>				
<b>Vitamin B-12 status</b>			0.065	+
Deficient	38	680 (564, 819)		
Marginally deficient	72	702 (620, 795)		
Normal	136	804 (728, 888)		
<b>&gt; 1399</b>				
<b>Vitamin B-12 status</b>			0.453	+
Deficient	26	733 (555, 968)		
Marginally deficient	66	704 (604, 820)		
Normal	99	816 (731, 911)		
<b>Health Services Use</b>				
<b>Private</b>				
<b>Vitamin B-12 status</b>			0.048	+
Deficient	14	546 (401, 745)		
Marginally deficient	32	638 (532, 765)		
Normal	76	728 (633, 838)		
<b>Private/Public</b>				
<b>Vitamin B-12 status</b>			0.675	+
Deficient	10	633 (515, 777)		
Marginally deficient	37	654 (580, 736)		
Normal	53	661 (585, 748)		
<b>Public</b>				
<b>Vitamin B-12 status</b>			<0.001	+
Deficient	114	617 (557, 685)		
Marginally deficient	197	654 (597, 717)		
Normal	320	827 (775, 883)		
<b>Other</b>				
<b>Vitamin B-12 status</b>			0.808	+
Deficient	15	578 (397, 842)		

## Online Supporting Material

Marginally deficient	28	706 (548, 910)		
Normal	34	605 (478, 766)		
<b>Use of Folic acid Containing Supplements</b>				
<b>No</b>				
<b>Vitamin B-12 status</b>			0.015	+
Deficient	97	634 (556, 723)		
Marginally deficient	176	620(558, 687)		
Normal	263	749 (684, 819)		
<b>Yes</b>				
<b>Vitamin B-12 status</b>			<0.001	+
Deficient	56	574 (491, 671)		
Marginally deficient	118	679 (610, 756)		
Normal	220	848 (770, 935)		
<b>Region</b>				
<b>Central</b>				
<b>Vitamin B-12 status</b>			0.313	+
Deficient	21	599 (410, 875)		
Marginally deficient	66	569 (462, 701)		
Normal	117	717 (612, 839)		
<b>North</b>				
<b>Vitamin B-12 status</b>			0.0002	+
Deficient	49	626 (521, 753)		
Marginally deficient	85	735 (622, 870)		
Normal	87	849 (729, 989)		
<b>South</b>				
<b>Vitamin B-12 status</b>			0.082	+
Deficient	29	599 (485, 738)		
Marginally deficient	62	589 (520, 667)		
Normal	151	711 (638, 793)		
<b>West</b>				
<b>Vitamin B-12 status</b>			0.005	+
Deficient	54	553 (472, 647)		
Marginally deficient	81	580 (501, 672)		
Normal	128	705 (608, 817)		

<sup>1</sup> Adjusted by, area, ethnicity, age, education, income, and region

<sup>2</sup> Positive (increasing) or negative (decreasing) geometric mean values