SUPPLEMENTAL MATERIALS

TITLE:
Hydration in relation to water insecurity, heat index, and lactation status in two small-scale populations in hot-humid and hot-arid environments

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SUPPLEMENTAL INFORMATION

List of questions used for the Household Water InSecurity Experience (HWISE) Scale

The following list of questions used to assess household water insecurity are from the validated Household Water InSecurity Experience (HWISE) Scale questionnaire (Young, Boateng, et al., 2019; Young, Collins, et al., 2019).

1) In the last 4 weeks, how frequently did you or anyone in your household worry you would not have enough water for all of your household needs?
2) In the last 4 weeks, how frequently has your household water supply from your main water source been interrupted or limited (e.g. water pressure, less water than expected)?
3) In the last 4 weeks, how frequently has there not been enough water in the household to wash clothes?
4) In the last 4 weeks, how frequently have you or anyone in your household had to change what was being eaten because there were problems with water (e.g. for washing foods, cooking, etc.)?
5) In the last 4 weeks, how frequently have you or anyone in your household had to go without washing hands after dirty activities (e.g., defecating or changing diapers, cleaning animal dung) because of problems with water?
6) In the last 4 weeks, how frequently have you or anyone in your household had to go without bathing because of problems with water (e.g., lack of water, unclean water, etc.)?
7) In the last 4 weeks, how frequently has your or anyone in your household's day been interrupted by problems with your water situation, such as problems getting or distributing water within the household? (Activities that may have been interrupted include caring for others, doing household chores, or attending social events, etc.)
8) In the last 4 weeks, how frequently did you or anyone in your household feel angry about your water situation?
9) In the last 4 weeks, how frequently has there not been as much water to drink as you would like for you or anyone in your household?
10) In the last 4 weeks, how frequently have you or anyone in your household gone to sleep thirsty because there wasn't any water to drink?
11) In the last 4 weeks, how frequently has there been no useable water whatsoever in your household?
12) In the last 4 weeks, how frequently have problems with water caused you or anyone in your household to feel ashamed/excluded/stigmatized?

Options and scoring for these questions were as follows:

0... Never (0 times in the last 4 weeks)

1... Rarely (1-2 times in the last 4 weeks)

2... Sometimes (3-10 times in the last 4 weeks)

3... Often or always (11+ times in the last 4 weeks)

List of questions used for the Household Food Insecurity Access Scale (HFIAS)

The following list of questions used to assess household water insecurity are from the validated Household Food Insecurity Access Scale (HFIAS) questionnaire (Coates et al., 2007).

1) In the past four weeks, did you worry that your household would not have enough food?
2) In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?
3) In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?
4) In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?
5) In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?
6) In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food?
7) In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?
8) In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?
9) In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?

Options and scoring for these questions were as follows:

0... Never (0 times in the last 4 weeks)

1... Rarely (1-2 times in the last 4 weeks)

2... Sometimes (3-10 times in the last 4 weeks)

3... Often or always (11+ times in the last 4 weeks)

SUPPLEMENTAL TABLES

Supplemental Table 1. All multiple logistic regression models run for Tsimane' Men

	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Individual's age (years)	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	(0.99 - 1.03)	(0.99 - 1.02)	(0.99 - 1.03)	(0.99 - 1.03)	(0.99 - 1.03)	(0.99 - 1.03)	(0.99 - 1.03)	(0.99 - 1.03)	(0.99 - 1.03)	(0.99 - 1.03)	(1.00 - 1.03)
BMI (kg/m^2)	1.10	1.14*	1.09	1.10	1.10	1.10	1.11	1.08	1.10		
	(0.97 - 1.25)	(1.01 - 1.29)	(0.96 - 1.24)	(0.97 - 1.25)	(0.97 - 1.25)	(0.97 - 1.26)	(0.97 - 1.27)	(0.95 - 1.23)	(0.97 - 1.25)		
Afternoon sample	1.45	1.90*		1.45	1.45	1.42	1.55	1.45	1.45	1.42	1.45
	(0.82 - 2.58)	(1.11 - 3.25)		(0.82 - 2.58)	(0.82 - 2.57)	(0.80 - 2.53)	(0.84 - 2.86)	(0.81 - 2.60)	(0.82 - 2.57)	(0.80 - 2.52)	(0.81 - 2.57)
Heat Index	1.22**		1.25***	1.22**	1.23***	1.23***	1.22**	1.25***	1.22**	1.24***	1.23***
	(1.08 - 1.38)		(1.11 - 1.41)	(1.08 - 1.38)	(1.09 - 1.38)	(1.09 - 1.40)	(1.07 - 1.39)	(1.10 - 1.41)	(1.08 - 1.38)	(1.10 - 1.40)	(1.09 - 1.39)
Time to collect water (10 min)	0.94	0.97	0.93	0.93	0.93	0.91	0.82	0.93	0.93	0.93	0.95
	(0.64 - 1.38)	(0.65 - 1.44)	(0.64 - 1.36)	(0.63 - 1.38)	(0.63 - 1.38)	(0.61 - 1.36)	(0.53 - 1.26)	(0.63 - 1.38)	(0.64 - 1.37)	(0.63 - 1.36)	(0.64 - 1.42)
HWISE score				1.00	1.01	1.15					
				(0.90 - 1.11)	(0.90 - 1.13)	(0.86 - 1.55)					
HFIAS score					0.99	1.01					
					(0.91 - 1.07)	(0.92 - 1.10)					
HWISE x HFIAS Interaction						0.99					
						(0.96 - 1.01)					
Born in wet season							1.24				
							(0.68 - 2.26)				
Days/week of meat/fish								0.98			
								(0.83 - 1.16)			
Diarrhea or fever									0.89		
									(0.21 - 3.72)		
Body fat percentage (BIA)										1.03	
										(0.96 - 1.11)	
Calculated Fat-Free Mass											1.04
											(0.98 - 1.11)
Observations	224	224	224	224	224	224	197	221	224	224	224
Log-Likelihood Full Model	-143.9	-150	-144.7	-143.9	-143.8	-143.3	-124.9	-141.5	-143.9	-144.6	-144
Chi-square test	17.92	9.622	16.45	17.91	18.02	18.97	18.47	18.63	17.92	16.97	20.51
P-value of Chi-square test	0.00305	0.0473	0.00247	0.00645	0.0119	0.0150	0.00517	0.00484	0.00644	0.00455	0.00100
AIC	299.7	310.1	299.4	301.7	303.6	304.6	263.8	297	301.7	301.2	300
BIC	320.2	327.1	316.4	325.6	330.9	335.3	286.8	320.8	325.6	321.6	320.5
Pseudo R^2	0.0734	0.0337	0.0682	0.0734	0.0737	0.0770	0.0851	0.0762	0.0734	0.0688	0.0725
Hosmer-Lemeshow P-value	0.770	0.478	0.400	0.771	0.751	0.966	0.558	0.787	0.618	0.715	0.884

Supplemental Table 2. All multiple logistic regression models run for Tsimane' Women

	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Individual's age (years)	1.02* (1.00 - 1.05)	1.02* (1.00 - 1.04)	1.02* (1.00 - 1.05)	1.02* (1.00 - 1.05)	1.03* (1.00 - 1.05)	1.03* (1.00 - 1.05)	1.03* (1.00 - 1.05)	1.02* (1.00 - 1.04)	1.02* (1.00 - 1.05)	1.02 (1.00 - 1.04)	1.03* (1.01 - 1.05)
BMI (kg/m^2)	1.06 (0.97 - 1.15)	1.06 (0.98 - 1.14)	1.06 (0.97 - 1.15)	1.06 (0.97 - 1.15)	1.06 (0.98 - 1.15)	1.06 (0.98 - 1.15)	1.11* (1.01 - 1.23)	1.06 (0.98 - 1.16)	1.05 (0.97 - 1.14)		
Afternoon sample	1.01 (0.57 - 1.81)	1.32 (0.76 - 2.27)		1.02 (0.57 - 1.83)	1.02 (0.57 - 1.83)	1.00 (0.56 - 1.80)	0.76 (0.40 - 1.45)	1.07 (0.59 - 1.92)	1.01 (0.57 - 1.81)	1.00 (0.56 - 1.80)	1.02 (0.57 - 1.82)
Heat Index	1.32*** (1.17 - 1.49)		1.32*** (1.17 - 1.49)	1.32*** (1.17 - 1.50)	1.34*** (1.18 - 1.51)	1.34*** (1.18 - 1.53)	1.31*** (1.15 - 1.49)	1.32*** (1.17 - 1.50)	1.32*** (1.17 - 1.49)	1.33*** (1.18 - 1.50)	1.31*** (1.16 - 1.49)
Time to collect water (10 min)	1.18 (0.84 - 1.67)	1.18 (0.83 - 1.68)	1.18 (0.84 - 1.67)	1.16 (0.82 - 1.63)	1.15 (0.81 - 1.64)	1.15 (0.81 - 1.64)	1.18 (0.80 - 1.73)	1.22 (0.85 - 1.77)	1.19 (0.84 - 1.69)	1.19 (0.84 - 1.69)	1.21 (0.85 - 1.72)
HWISE score				1.07 (0.99 - 1.17)	1.10 (1.00 - 1.21)	1.21 (0.88 - 1.65)					
HFIAS score					0.96 (0.88 - 1.04)	0.97 (0.89 - 1.06)					
HWISE x HFIAS Interaction						0.99 (0.96 - 1.02)					
Born in wet season							0.83 (0.45 - 1.54)				
Days/week of meat/fish								0.91 (0.76 - 1.08)			
Diarrhea or fever									2.86 (0.41 - 19.81)		
Body fat percentage (BIA)										1.03 (0.99 - 1.07)	
Calculated Fat-Free Mass											1.04 (0.96 - 1.13)
Lactating	3.14** (1.54 - 6.41)	2.85** (1.45 - 5.59)	3.14** (1.54 - 6.40)	3.25** (1.57 - 6.69)	3.27** (1.59 - 6.72)	3.35** (1.62 - 6.95)	3.33** (1.55 - 7.16)	3.03** (1.48 - 6.20)	3.25** (1.58 - 6.66)	3.13** (1.54 - 6.40)	3.16** (1.56 - 6.41)
Pregnant	0.59 (0.22 - 1.55)	0.62 (0.24 - 1.63)	0.59 (0.22 - 1.55)	0.57 (0.22 - 1.52)	0.57 (0.21 - 1.51)	0.58 (0.22 - 1.56)	0.54 (0.18 - 1.60)	0.57 (0.21 - 1.51)	0.61 (0.23 - 1.63)	0.54 (0.19 - 1.48)	0.65 (0.24 - 1.72)
Lactating & pregnant	1.30 (0.36 - 4.69)	1.52 (0.40 - 5.81)	1.31 (0.37 - 4.68)	1.18 (0.34 - 4.05)	1.25 (0.36 - 4.38)	1.28 (0.37 - 4.44)	1.13 (0.31 - 4.05)	1.24 (0.33 - 4.62)	1.36 (0.38 - 4.94)	1.31 (0.36 - 4.75)	1.25 (0.34 - 4.56)
Observations	235	235	235	235	235	235	207	231	235	235	235
Log-Likelihood Full Model	-141.6	-152.8	-141.6	-140.5	-140	-139.7	-122.9	-139.3	-141.1	-141.5	-142
Chi-square test	34.11	17.88	34.10	34.13	35.18	34.68	32.92	32.66	36.70	35.35	34.61
P-value of Chi-square test	3.88e-05	0.0125	1.65e-05	8.48e-05	0.000116	0.000280	0.000138	0.000153	2.97e-05	2.30e-05	3.15e-05
AIC	301.2	321.5	299.2	301	301.9	303.5	265.8	298.5	302.3	301	302.1
BIC	332.3	349.2	326.9	335.6	340	345	299.1	332.9	336.9	332.1	333.2
Pseudo R^2	0.127	0.0577	0.127	0.133	0.137	0.138	0.142	0.125	0.129	0.127	0.124
Hosmer-Lemeshow P-value	0.298	0.801	0.238	0.745	0.364	0.168	0.153	0.376	0.498	0.0440	0.501

Supplemental Table 3. All multiple logistic regression models run for Tsimane' Children

	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR* (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Individual's age (years)	1.12 (1.00 - 1.26)	1.09 (0.97 - 1.22)	1.12 (0.99 - 1.26)	1.13* (1.00 - 1.26)	1.11 (0.99 - 1.24)	1.10 (0.98 - 1.24)	1.17* (1.04 - 1.33)	1.12 (1.00 - 1.26)	1.12 (1.00 - 1.25)	0.96 (0.76 - 1.21)
Male	1.13 (0.61 - 2.11)	1.03 (0.56 - 1.91)	1.10 (0.59 - 2.02)	1.16 (0.61 - 2.19)	1.15 (0.60 - 2.18)	1.15 (0.60 - 2.19)	1.13 (0.57 - 2.26)	1.18 (0.63 - 2.24)		
BMI (kg/m^2)	1.00 (0.64 - 1.57)	0.97 (0.63 - 1.49)	0.99 (0.64 - 1.54)	0.98 (0.62 - 1.56)	0.98 (0.61 - 1.57)	0.95 (0.58 - 1.54)	0.94 (0.55 - 1.59)	1.04 (0.66 - 1.64)		
Afternoon sample	1.68 (0.86 - 3.30)	2.01* (1.05 - 3.83)		1.61 (0.82 - 3.16)	1.65 (0.83 - 3.27)	1.63 (0.82 - 3.22)	1.54 (0.73 - 3.25)	1.74 (0.88 - 3.42)	1.67 (0.85 - 3.28)	1.62 (0.82 - 3.18)
Heat Index	1.20* (1.04 - 1.39)		1.23** (1.06 - 1.44)	1.23* (1.05 - 1.44)	1.22* (1.04 - 1.43)	1.23* (1.04 - 1.44)	1.15 (1.00 - 1.33)	1.19* (1.02 - 1.38)	1.19* (1.03 - 1.39)	1.21* (1.04 - 1.40)
Time to collect water (10 min)	1.67 (0.85 - 3.26)	1.68 (0.79 - 3.55)	1.72 (0.91 - 3.23)	1.64 (0.85 - 3.17)	1.66 (0.85 - 3.22)	1.59 (0.82 - 3.09)	1.50 (0.67 - 3.39)	1.73 (0.87 - 3.45)	1.67 (0.85 - 3.28)	1.69 (0.86 - 3.31)
HWISE score				1.12 (0.97 - 1.30)	1.09 (0.94 - 1.27)	1.28 (0.84 - 1.95)				
HFIAS score					1.07 (0.99 - 1.15)	1.10 (1.00 - 1.21)				
HWISE x HFIAS Interaction						0.98 (0.94 - 1.02)				
Born in wet season							1.12 (0.60 - 2.08)			
Diarrhea or fever								2.16 (0.71 - 6.56)		
Body fat percentage (BIA)									0.99 (0.92 - 1.05)	
Calculated Fat-Free Mass										1.06 (0.98 - 1.14)
Observations	219	219	219	219	219	219	188	219	219	219
Log-Likelihood Full Model	-134.6	-138.4	-136	-133.1	-131.6	-131.2	-115.5	-134	-134.7	-133.9
Chi-square test	17.12	8.887	13.18	18.51	22.26	21.34	14.58	18.03	17.01	18.80
P-value of Chi-square test	0.00887	0.114	0.0217	0.00987	0.00445	0.0112	0.0418	0.0118	0.00448	0.00210
AIC	283.3	288.9	284.1	282.3	281.3	282.4	247	283.9	281.3	279.8
BIC	307	309.2	304.4	309.4	311.8	316.3	272.9	311	301.6	300.1
Pseudo R^2	0.0669	0.0406	0.0573	0.0773	0.0877	0.0907	0.0569	0.0716	0.0668	0.0720
Hosmer-Lemeshow P-value	0.350	0.717	0.735	0.629	0.603	0.0130	0.375	0.444	0.862	0.399

*Note: Joint effects of HWISE score and HFIAS score were observed in the model without the interaction term (OR: 1.17, 95% CI: 1.00-1.36, *P*=0.048).

Supplemental Table 4. All multiple logistic regression models run for Daasanach Men

	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Individual's age (years)	1.00 (0.97 - 1.04)	1.01 (0.97 - 1.04)	1.00 (0.96 - 1.04)	1.00 (0.97 - 1.04)	1.01 (0.97 - 1.04)	1.01 (0.97 - 1.04)	1.00 (0.97 - 1.04)	1.01 (0.98 - 1.05)	1.00 (0.97 - 1.04)	1.01 (0.97 - 1.05)	1.00 (0.96 - 1.05)
BMI (kg/m^2)	0.81 (0.55 - 1.19)	0.81 (0.56 - 1.18)	0.80 (0.54 - 1.20)	0.81 (0.55 - 1.19)	0.80 (0.54 - 1.18)	0.80 (0.54 - 1.19)	0.81 (0.56 - 1.17)	0.86 (0.60 - 1.23)	0.81 (0.56 - 1.18)		
Afternoon sample	1.65 (0.45 - 6.04)	2.12 (0.74 - 6.04)		1.65 (0.44 - 6.12)	1.59 (0.41 - 6.22)	1.65 (0.44 - 6.19)	1.63 (0.42 - 6.34)	1.36 (0.34 - 5.47)	1.62 (0.43 - 6.07)	1.85 (0.48 - 7.11)	1.69 (0.47 - 6.05)
Heat Index	1.12 (0.78 - 1.61)		1.23 (0.91 - 1.64)	1.12 (0.78 - 1.61)	1.11 (0.78 - 1.57)	1.10 (0.78 - 1.55)	1.10 (0.74 - 1.64)	1.15 (0.79 - 1.67)	1.12 (0.78 - 1.60)	1.14 (0.78 - 1.67)	1.16 (0.81 - 1.66)
Time to collect water (10 min)	1.00 (0.89 - 1.13)	1.00 (0.88 - 1.13)	1.00 (0.88 - 1.13)	1.00 (0.89 - 1.13)	0.99 (0.87 - 1.13)	1.00 (0.87 - 1.13)	1.00 (0.88 - 1.12)	0.99 (0.87 - 1.13)	1.00 (0.88 - 1.13)	0.99 (0.88 - 1.12)	0.99 (0.88 - 1.12)
HWISE score				1.00 (0.93 - 1.07)	1.04 (0.96 - 1.12)	1.07 (0.92 - 1.25)					
HFIAS score					0.93 (0.83 - 1.03)	0.96 (0.83 - 1.11)					
HWISE x HFIAS Interaction						1.00 (0.99 - 1.01)					
Born in wet season							1.65 (0.55 - 4.92)				
Days/week of meat/fish								1.13 (0.85 - 1.50)			
Diarrhea or fever									0.53 (0.06 - 4.34)		
Body fat percentage (BIA)										0.97 (0.84 - 1.13)	
Calculated Fat-Free Mass											0.95 (0.83 - 1.09)
Observations	107	107	107	107	107	107	107	106	107	104	104
Log-Likelihood Full Model	-44.55	-44.69	-44.78	-44.55	-43.96	-43.89	-44.14	-42.66	-44.36	-42.90	-42.66
Chi-square test	3.462	2.893	3.309	3.560	4.935	5.132	4.221	3.700	4.173	3.253	3.328
P-value of Chi-square test	0.629	0.576	0.507	0.736	0.668	0.743	0.647	0.717	0.653	0.661	0.650
AIC	101.1	99.38	99.57	103.1	103.9	105.8	102.3	99.31	102.7	97.80	97.32
BIC	117.1	112.7	112.9	121.8	125.3	129.8	121	118	121.4	113.7	113.2
Pseudo R^2	0.0489	0.0460	0.0440	0.0489	0.0615	0.0630	0.0576	0.0517	0.0530	0.0392	0.0446
Hosmer-Lemeshow P-value	0.374	0.196	0.264	0.374	0.199	0.230	0.161	0	0.344	0.0700	0.312

Supplemental Table 5. All multiple logistic regression models run for Daasanach Women

	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR* (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Individual's age (years)	0.95 (0.89 - 1.01)	0.95 (0.89 - 1.02)	0.94* (0.89 - 1.00)	0.95 (0.88 - 1.01)	0.94 (0.88 - 1.01)	0.93 (0.87 - 1.00)	0.95 (0.89 - 1.02)	0.95 (0.88 - 1.02)	0.95 (0.89 - 1.01)	0.95 (0.88 - 1.01)	0.97 (0.91 - 1.02)
BMI (kg/m^2)	1.22** (1.05 - 1.42)	1.19* (1.04 - 1.36)	1.22* (1.05 - 1.42)	1.24** (1.05 - 1.46)	1.25** (1.06 - 1.48)	1.32** (1.10 - 1.59)	1.21* (1.04 - 1.42)	1.22* (1.03 - 1.43)	1.23** (1.06 - 1.43)		
Afternoon sample	2.12 (0.49 - 9.24)	4.98** (1.57 - 15.84)		2.28 (0.51 - 10.15)	2.30 (0.53 - 10.04)	2.52 (0.56 - 11.36)	2.42 (0.52 - 11.36)	1.83 (0.36 - 9.42)	2.00 (0.46 - 8.66)	2.67 (0.60 - 11.83)	1.97 (0.45 - 8.66)
Heat Index	1.49* (1.03 - 2.14)		1.69*** (1.27 - 2.25)	1.47* (1.01 - 2.14)	1.48* (1.03 - 2.13)	1.48* (1.02 - 2.15)	1.47* (1.01 - 2.14)	1.46 (0.96 - 2.23)	1.54* (1.04 - 2.28)	1.44* (1.03 - 2.03)	1.45* (1.04 - 2.01)
Time to collect water (10 min)	0.91 (0.78 - 1.05)	0.94 (0.82 - 1.07)	0.90 (0.78 - 1.03)	0.91 (0.79 - 1.04)	0.91 (0.79 - 1.05)	0.90 (0.78 - 1.04)	0.90 (0.78 - 1.03)	0.90 (0.79 - 1.04)	0.91 (0.79 - 1.05)	0.89 (0.77 - 1.03)	0.91 (0.78 - 1.06)
HWISE score				1.03 (0.96 - 1.11)	1.01 (0.91 - 1.11)	1.14 (0.96 - 1.37)					
HFIAS score					1.04 (0.91 - 1.18)	1.19 (1.00 - 1.43)					
HWISE x HFIAS Interaction						0.99 (0.98 - 1.00)					
Born in wet season							1.68 (0.42 - 6.78)				
Days/week of meat/fish								1.07 (0.84 - 1.36)			
Diarrhea or fever									2.11 (0.49 - 9.05)		
Body fat percentage (BIA)										1.10* (1.02 - 1.19)	
Calculated Fat-Free Mass											1.13 (0.99 - 1.29)
Lactating	2.03 (0.54 - 7.61)	1.89 (0.50 - 7.19)	1.96 (0.53 - 7.19)	1.85 (0.47 - 7.30)	1.89 (0.46 - 7.69)	1.93 (0.49 - 7.68)	2.16 (0.54 - 8.59)	2.71 (0.68 - 10.73)	1.90 (0.50 - 7.21)	1.93 (0.49 - 7.63)	2.28 (0.60 - 8.60)
Pregnant	3.03 (0.52 - 17.80)	3.45 (0.48 - 24.59)	2.56 (0.51 - 12.71)	2.82 (0.46 - 17.39)	2.65 (0.42 - 16.58)	2.30 (0.34 - 15.77)	2.94 (0.49 - 17.67)	3.42 (0.58 - 20.03)	3.31 (0.54 - 20.43)	2.67 (0.39 - 18.34)	3.31 (0.55 - 19.79)
Observations	120	120	120	120	120	120	120	116	120	119	119
Log-Likelihood Full Model	-41.78	-43.73	-42.34	-41.53	-41.42	-40.47	-41.45	-40.33	-41.40	-41.70	-43.17
Chi-square test	24.19	25.21	20.79	22.86	22.56	25.25	24.81	22.89	23.77	23.14	26.12
P-value of Chi-square test	0.00105	0.000312	0.00200	0.00354	0.00727	0.00490	0.00168	0.00351	0.00250	0.00161	0.000479
AIC	99.56	101.5	98.68	101.1	102.8	102.9	100.9	98.65	100.8	99.40	102.3
BIC	121.9	121	118.2	126.1	130.7	133.6	126	123.4	125.9	121.6	124.6
Pseudo R^2	0.249	0.214	0.239	0.254	0.256	0.273	0.255	0.244	0.256	0.248	0.222
Hosmer-Lemeshow P-value	0.510	0.0510	0.578	0.314	0.502	0.368	0.897	0.390	0.321	0.475	0.0910

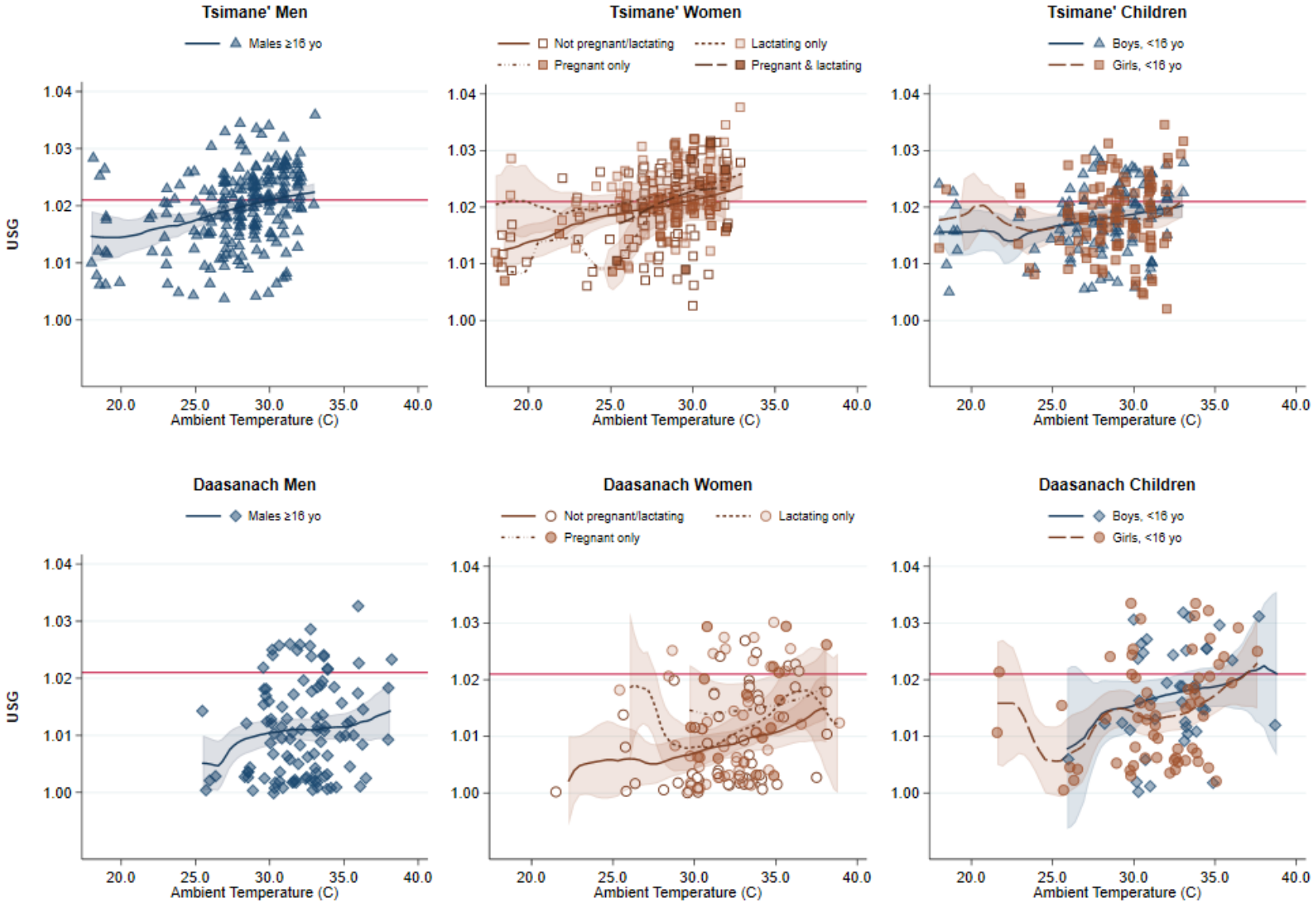
*Note: Joint effects were observed for HWISE score, HFIAS score, and their interaction term (OR: 1.35, 95% CI: 1.02-1.80, P=0.037).

Supplemental Table 6. All multiple logistic regression models run for Daasanach Children

	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Individual's age (years)	1.09 (0.93 - 1.28)	1.09 (0.93 - 1.28)	1.10 (0.95 - 1.28)	1.09 (0.93 - 1.28)	1.10 (0.93 - 1.29)	1.10 (0.93 - 1.30)	1.08 (0.92 - 1.28)	1.09 (0.93 - 1.29)	1.06 (0.89 - 1.27)	1.48 (0.98 - 2.22)
Male	1.16 (0.41 - 3.34)	1.16 (0.41 - 3.32)	1.41 (0.54 - 3.63)	1.17 (0.40 - 3.46)	1.14 (0.38 - 3.39)	1.11 (0.38 - 3.25)	1.10 (0.36 - 3.35)	1.16 (0.40 - 3.33)		
BMI (kg/m^2)	1.17 (0.67 - 2.03)	1.17 (0.67 - 2.06)	1.38 (0.78 - 2.44)	1.17 (0.67 - 2.03)	1.20 (0.68 - 2.14)	1.21 (0.68 - 2.14)	1.14 (0.62 - 2.10)	1.15 (0.67 - 1.98)		
Afternoon sample	8.96*** (2.49 - 32.20)	8.53*** (3.18 - 22.87)		9.00*** (2.50 - 32.37)	9.21*** (2.63 - 32.25)	9.41*** (2.68 - 32.98)	10.52*** (2.83 - 39.17)	9.31*** (2.52 - 34.38)	9.57*** (2.63 - 34.78)	12.89*** (3.34 - 49.69)
Heat Index	0.98 (0.69 - 1.38)		1.35 (0.96 - 1.90)	0.98 (0.69 - 1.39)	0.99 (0.70 - 1.40)	0.98 (0.69 - 1.38)	0.99 (0.70 - 1.40)	0.97 (0.69 - 1.38)	1.03 (0.69 - 1.52)	1.00 (0.67 - 1.48)
Time to collect water (10 min)	0.94 (0.86 - 1.02)	0.94 (0.86 - 1.02)	0.96 (0.88 - 1.05)	0.94 (0.86 - 1.02)	0.94 (0.87 - 1.02)	0.94 (0.86 - 1.02)	0.94 (0.86 - 1.02)	0.94 (0.86 - 1.02)	0.92* (0.86 - 1.00)	0.92* (0.84 - 1.00)
HWISE score				1.00 (0.93 - 1.09)	0.98 (0.87 - 1.12)	1.05 (0.83 - 1.34)				
HFIAS score					1.04 (0.90 - 1.20)	1.10 (0.89 - 1.36)				
HWISE x HFIAS Interaction						1.00 (0.99 - 1.01)				
Born in wet season							3.52* (1.28 - 9.65)			
Diarrhea or fever								0.76 (0.21 - 2.70)		
Body fat percentage (BIA)									0.96 (0.83 - 1.10)	
Calculated Fat-Free Mass										0.87 (0.74 - 1.02)
Observations	102	102	102	102	102	102	102	102	98	98
Log-Likelihood Full Model	-52.41	-52.42	-59.23	-52.40	-52.24	-52.08	-49.31	-52.33	-49.10	-48.08
Chi-square test	22.79	22.81	5.225	23.43	23.60	25.51	28.30	22.70	23.69	26.73
P-value of Chi-square test	0.000869	0.000368	0.389	0.00143	0.00268	0.00246	0.000194	0.00192	0.000249	6.44e-05
AIC	118.8	116.8	130.5	120.8	122.5	124.2	114.6	120.7	110.2	108.2
BIC	137.2	132.6	146.2	141.8	146.1	150.4	135.6	141.7	125.7	123.7
Pseudo R^2	0.174	0.174	0.0665	0.174	0.177	0.179	0.223	0.175	0.197	0.214
Hosmer-Lemeshow P-value	0.180	0.0320	0.588	0.389	0.348	0.0520	0.340	0.773	0.754	0.414

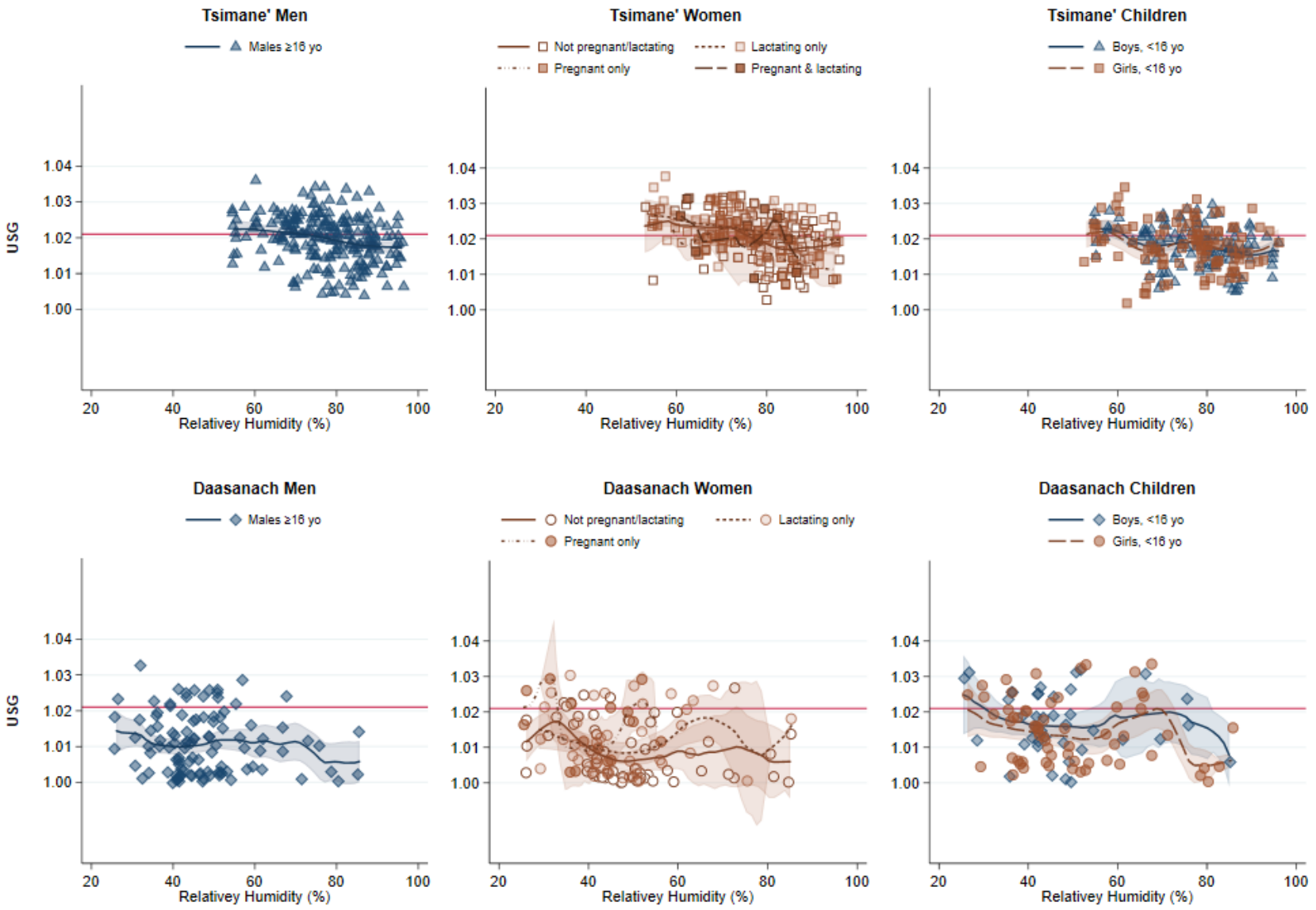
SUPPLEMENTAL FIGURES

Supplemental Figure 1. Urine Specific Gravity by Ambient Temperature



Local polynomial smooth plots with CIs

Supplemental Figure 2. Urine Specific Gravity by Relative Humidity



Local polynomial smooth plots with CIs

REFERENCES FOR SUPPLEMENTAL INFORMATION

Coates, J., Swindale, A., & Bilinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3)*. Washington, D.C.: Food and Nutrition Technical Assistance Project, Academy for Educational Development.

Young, S. L., Boateng, G. O., Jamaluddine, Z., Miller, J. D., Frongillo, E. A., Neilands, T. B., . . . Stoler, J. (2019). The Household Water InSecurity Experiences (HWISE) Scale: development and validation of a household water insecurity measure for low-income and middle-income countries. *BMJ Global Health, 4*(5), e001750. doi:10.1136/bmjgh-2019-001750

Young, S. L., Collins, S. M., Boateng, G. O., Neilands, T. B., Jamaluddine, Z., Miller, J. D., . . . Wutich, A. (2019). Development and validation protocol for an instrument to measure household water insecurity across cultures and ecologies: the Household Water InSecurity Experiences (HWISE) Scale. *BMJ Open, 9*(1), e023558. doi:10.1136/bmjopen-2018-023558