## CHILD FOSTERAGE AND SEX-BIASED NUTRITIONAL OUTCOMES AMONG NAMIBIAN PASTORALISTS – SUPPORTING INFORMATION

**Model Specifications** – The following models were fit to rstan using the map2stan function of the *rethinking* package. As an alternate approach to predict Z-scores, we used age as a random effect, but results were very similar to those presented below.

To predict Z-scores in children and standardized anthropometrics in adults:

 $\begin{aligned} Zscore_{i} \sim Normal (\mu_{i}, \sigma) \\ \mu_{i} &= \alpha + \beta_{s} Sex_{[i]} + \beta_{a} Age_{[i]} + \beta_{f} Fosterage_{[i]} + \beta_{sf} Fosterage_{[i]} Sex_{[i]} \\ \alpha \sim Normal (0,10) \\ \beta_{s}, \beta_{a}, \beta_{f}, \beta_{sf} \sim Normal (0,5) \\ \sigma \sim Half Cauchy (0,5) \end{aligned}$ 

To predict probability of having a Z-score < -2 in children:  $Z_i \sim Binomial (1, p_i)$   $logit(p_i) = \alpha + \beta_s Sex_{[i]} + \beta_a Age_{[i]} + \beta_f Fosterage_{[i]} + \beta_{sf} Fosterage_{[i]}Sex_{[i]}$   $\alpha \sim Normal (0,10)$   $\beta_s, \beta_a, \beta_f, \beta_{sf} \sim Normal (0,5)$ 

Table S1: Model results							
OUTCOME	INTERCEPT	SEX	FOSTERAGE	SEX*FOSTERAGE	AGE		
Height Z-score	0.24	-0.65	-0.60	0.25	0.07		
	[-0.04, 0.55]	[-1.04, -0.24]	[-1.05, -0.11]	[-0.40, 0.90]	[-0.09, 0.23]		
Weight Z-score	0.04	-0.38	-0.11	-0.22	-0.08		
	[-0.18, 0.27]	[-0.68, -0.07]	[-0.46, 0.24]	[-0.72, 0.26]	[-0.21, 0.04]		
DMI 7 cooro	0.02	0.05	0.07	0 54	0.22		
DMI Z-SCOLE	-0.03	0.03	0.07 [_0.25_0.37]	-0.34 [_0.080.11]	-0.22 [_0.33_0.11]		
	[-0.22, 0.17]	[-0.32, 0.22]	[-0.23, 0.37]	[-0.90, -0.11]	[-0.55, 0.11]		
Height Z-score <-2	-3.51	1.47	2.20	-1.34	-0.41		
	[-4.60, -2.33]	[0.23, 2.73]	[0.88, 3.44]	[-2.81, 0.19]	[-0.81, -0.03]		
Weight Z-score <-2	-5.80	2.94	2.66	-3.60	-0.43		
	[-8.23, -3.30]	[0.28, 5.42]	[-0.12, 5.37]	[-6.74, -0.35]	[-1.18, 0.37]		
BMI Z-score <-2	-6.74	3.17	1.85	-0.79	0.70		
	[-9.63, -3.91]	[0.13, 6.07]	[-1.37, 5.07]	[-4.18, 2.65]	[0.16, 1.23]		
Standardized Adult	-0.48	1.39	-0.27	0.06	-0.08		
Height	[-0.58, -0.37]	[1.22, 1.56]	[-0.48, -0.06]	[-0.25, 0.37]	[-0.15, -0.01]		
Standardized Adult	0.30	-0.79	0.05	0.03	-0.08		
BMI	[0.16, 0.44]	[-1.02, -0.57]	[-0.24, 0.32]	[-0.39, 0.44]	[-0.17, 0.01]		

Posterior means [and 89% percentile intervals] for models predicting Z-scores and the probability of Z-scores < -2 in children, and standardized anthropometrics in adults. Sex coded as male=1, female=0.

Table S2: Comparisons by sex and fosterage								
OUTCOME		FOSTERED MALE/FEMALE	NON-FOSTERED MALE/FEMALE	FOSTERED/NON -FOSTERED MALE	FOSTERED/NON -FOSTERED FEMALE			
HAZ	Mean Z Score	-0.75/-0.33	-0.43/0.25	-0.75/-0.43	-0.33/0.25			
	% Difference	88.6%	99.4%	87.4%	97.8%			
	Mean difference [89% PI]	0.40 [-0 13 0 93]	0.65 [0 24, 1 07]	0.35 [-0 12, 0 84]	0.60 [0.13, 1.07]			
WAZ	Mean Z Score	-0.68/-0.10	-0.30/-0.03	-0.68/-0.30	-0.10/-0.03			
	% Difference	99.0%	97.3%	91.9%	69.8%			
	Mean difference	0.59	0.38	0.33	0.11			
	[89% PI]	[0.17, 0.98]	[0.06, 0.69]	[-0.04, 0.70]	[-0.24, 0.48]			
BMI-Z	Mean Z Score	-0.57/-0.03	-0.02/-0.02	-0.57/-0.02	-0.03/-0.02			
	% Difference	99.5%	61.2%	99.0%	62.8%			
	Mean difference	0.59	0.05	0.48	0.07			
	[89% PI]	[0.23, 0.95]	[-0.23, 0.33]	[0.15, 0.80]	[-0.25, 0.40]			
HAZ < -2	Probability	32.9%/29.0%	13.8%/3.7%	32.9%/13.8%	29.0%/3.7%			
	% Difference	58.9%	98.2%	94.8%	99.9%			
	Mean difference	0.04	0.10	0.19	0.25			
	[89% PI]	[-0.22, 0.31]	[0.10, 0.18]	[-0.02, 0.40]	[0.08, 0.42]			
WAZ < -2	Probability	3.7%/6.1%	6.8%/0.8%	3.7%/6.8%	6.1%/0.8%			
	% Difference	67.9%	98.6%	77.6%	95.7%			
	Mean difference	0.02	0.06	0.03	0.05			
	[89% PI]	[-0.06, 0.12]	[0.01, 0.12]	[-0.05,0.11]	[-0.01, 0.12]			
BMI-Z <-2	Probability	9.6%/1.4%	3.5%/0.4%	9.6%/3.5%	1.4%/0.4%			
	% Difference	97.8%	97.2%	89.1%	81.1%			
	Mean difference	0.08	0.03	0.06	0.01			
	[89% PI]	[0, 0.16]	[0, 0.07]	[-0.03, 0.15]	[-0.01, 0.03]			

Percent difference indicates the difference in posterior for the larger group minus the smaller group greater than zero. Differences are also expressed via mean and 89% interval.

Table S3: Adult comparisons by fosterage							
OUTCOME		FOSTERED/NON- FOSTERED MALE	FOSTERED/NON- FOSTERED FEMALE				
Adult Height	Mean Height (cm)	174.2/175.9	162.4/164.4				
	% Difference	91.9%	97.5%				
	Mean difference [89% PI]	0.21 [-0.04, 0.45]	0.27 [0.06, 0.50]				
Adult BMI	Mean BMI	22.9/22.6	24.3/24.3				
	% Difference	66.2%	60.2%				
	Mean difference [89% PI]	0.08 [-0.23, 0.40]	0.05 [-0.25, 0.33]				

Percent difference indicates the difference in posterior for the larger group minus the smaller group greater than zero. Differences are also expressed via mean and 89% interval, here in z-score units.



Figure S1: Posterior density estimates for the parameters predicting Z-scores in Himba children



Figure S2: Posterior density estimates for the parameters used to predict probability of Z-score <-2 in Himba children

value



Figure S3: Posterior density estimates for the parameters used to predict anthropometrics in Himba adults



Figure S4: Loess curves of Z-scores for Himba children and adults.

Adult points indicate the mean standardized anthropometric and standard error by category from the adult sample. Nonfostered individuals represented by solid lines and points, fostered individuals represented by dotted lines and unfilled points. Males in blue, females in orange.