

West African Medical Missions Research Protocol: Household Dietary Diversity Score and Household Hunger Scale

I. Translation and Adaptation Preparing survey modules for use in new settings

- Adapts survey tool to the local context
- Ensures terms and concepts expressed in the survey are appropriately communicated
- Identifies terminology that will need to be contextualized
- Verifies that questions retain their original meaning after changes are made

1. Conduct Initial Translation

- i. Once the preliminary survey questions are assembled in English, distribute the module to three selected 3rd and 4th year students from the YSSL program. Assign each to transcribe the survey questions, as they understand them, from English into Krio.
- ii. Another native Sierra Leonean, designated as the chief survey reviewer, translates each of the student translations from Krio back into English to identify discrepancies in the meaning of words or phrases.
- iii. The translators then meet with the Primary Investigator to discuss the variations in translation and decide the most accurate translation for each question. Particular attention is paid to key terms and phrases in the survey, which are indicated in Tables 1 and 2.
- iv. The survey is reviewed again with the chief survey reviewer to remove foods unfamiliar to the region, and to add (in the language the survey will be administered) locally available and culturally common foods.

Table 1. Intended Meaning of Excerpts from Q13, Q14, Q15 that May Require Adaptation

Question	Intended Meaning of Question
Q13: No food of any kind in the house	This question asks about a situation where there is no food to eat of any kind in the house because food was not available to household members through usual means.
Q14: Go to sleep hungry because there was not enough food	This question asks whether the respondent or other household members felt hungry at bedtime because they did not have enough food to eat during the day and evening.
Q15: Go a whole day and night without eating	This question asks whether any household member did not eat from the time they awoke in the morning because there was not enough food. A person who chooses not to eat for a whole day (e.g. fasting or on a diet) should not respond "yes".

Table 2. Intended Meaning of Terms and Phrases that May Require Adaptation

Term	Intended Meaning of Term
Food	The word "food" might be synonymous with the main staple food in some cultures and languages. The use of the word "food" in this survey, however, means all food, or anything that is edible, not just the staple starch. This distinction must be communicated.
House	Q13 asks about the availability of food in the household. This term, refers to any physical structure where the household resides. This can be a house, compound, or any other word that describes a physical structure where food might be stored.
Household	A household is a group of people living together, even if not relatives of each other, who share food from the same pot and are answerable to the same head.
Hungry	To be "hungry" is not necessarily a person who has not eaten at all; a person can be hungry if they did not eat enough to fill the belly.

2. Review the Module with Key Informants

- i. Organize a series of meetings with key informants (who speak the language in which the survey will be administered) in each survey locality. Typical key informants:
 - Government officials, experts at national level if the work is not restricted to a single locality
 - Community leaders, agricultural or health extension workers at community level
 - Women in the community who are responsible for food planning and preparation for the household
 - Academics
 - Employees of organizations who work with food insecurity in the area

- ii. The person interviewing the key informant should follow the process similar to that in the example below.

<p>Key Informant Dialogue</p> <p><i>West African Medical Missions is in the process of adopting a survey to assess local dietary diversity and food insecurity. As important members of the community, we would like to consult with you to ensure that the questions we are using are understood in this setting.</i></p> <p><i>Therefore, I will ask you some questions to help us clarify some of the phrases used in the survey for this area and culture. Please participate freely in this discussion. You have the option of not participating in this process and may choose to leave or to not answer a question at any time.</i></p> <p><i>In the first part of the survey, we ask individuals to say if any member of his or her household has eaten from any of twelve food groups at all in the previous week. For each food group, let's review the foods listed and add locally available food items.</i></p> <ol style="list-style-type: none"> <i>For the cereals group, we specifically mention bread, biscuits, wheat, couscous, corn, corn flour, oat, rice, rice akara, macaroni, pap, bulgor and millet. Are any of these not locally available in this area or during this season? Are there any commonly eaten grains not included in this list?</i> <i>For the root and tubers group, we specifically mention Irish potatoes, plantains, cassava, fufu, gari, white sweet potatoes, yams, and eba. Are any of these not locally available in this area or during this season? Are there any commonly eaten roots or tubers not included in this list?</i> <i>For the vegetables group, we specifically mention yabas (onion), lettuce, cabbage, garden eggs, jakato, cucumber, red tomato, green peppers, hot peppers and coco. Are any of these not locally available in this area or during this season? Are there any commonly eaten vegetables not included in this list?</i> <i>For the fruits group, we specifically mention apples, bananas, pear, guava, oranges, grapefruit, watermelon, pineapple and sweet sherp. Are any of these not locally available in this area or during this season? Are there any commonly eaten fruits not included in this list?</i> <i>For the meat and poultry group, we specifically mention beef and cow, pork and hog, sausage, lamb, goat, rabbit, bush meat, chicken, snake, monkey, duck and bird. Are any of these not locally available in this area or during this season? Are there any commonly eaten meats not included in this list?</i> <i>(No need to ask about group 6 – eggs)</i> <i>For the fish and seafood group, we specifically mention fresh or dried fish, oyster, shrimp, crab, snails and lobster. Are any of these not locally available in this area or during this season? Are there any commonly eaten fish or seafood not included in this list?</i> <i>For the pulses/legumes/nuts group, we specifically mention soybeans, beans, beans akara, groundnuts or other nuts, peanut butter or seeds or foods made with these. Are any of these not locally available in this area or during this season? Are there any commonly eaten pulses, legumes or nuts not included in this list?</i> <i>For the milk and milk products group, we specifically mention milk, cheese, yogurt, infant formula, ice cream, sour cream, sour milk, or other milk products. Are any of these not locally available in this area or during this season? Are there any commonly eaten milk products not included in this list?</i> <i>For the oil/fats group, we specifically mention food made with oil, coconut oil, mayonnaise, tolar, natai, fat or butter. Are any of these not locally available in this area or during this season? Are there any commonly eaten oils or fats not included in this list?</i> <i>For the sugar/honey group, we specifically mention sugar, honey, sweet milk, soft drink, juice, chocolate, candy, cookies or cakes. Are any of these not locally available in this area or during this season? Are there any commonly eaten sugars not included in this list?</i>
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12. For the **miscellaneous** group, we specifically mention spices, black pepper, salt, ketchup, hot sauce, alcohol, tea and coffee. Are any of these not locally available in this area or during this season? Are there any commonly eaten miscellaneous foods not included in this list?

- Are there any locally available fortified foods that you know of, such as iodized salt and availability of red palm oil or palm nuts?
- What are the most common meals or dishes eaten by community members? What are the main ingredients used in those dishes?
- We would like to clarify the way that a “household” is described in this culture/area. We are specifically asking about a household and not a family. For instance, “household” might be defined as “people who live together and share food from a common pot.” How would people here commonly describe a household?
- We need to find a way to ask questions about “food” using the best term or phrase to mean any type of food. What would be the best term that would be understood to mean this? We also want to ensure the terms “food” and “meal” are expressed independently. If we said “food” do you think people would understand that we mean anything that can be eaten or drunk, and not just the major staple? Are there different words or terms for food in your community?
- We would like to add a phrase in our survey instrument that clarifies the meaning of “no food at all.” By “no food at all” we mean that the food was not available in the household and could not be accessed by the household's usual means. What are the terms that best describe the concept of not having food at hand and not being able to access food through the usual means and channels?
- What do you understand the following question to mean? “Did you or any household member go to sleep at night hungry because there was not enough food?” Is there a specific way to say this in the local language that makes the meaning clear?
- What do you understand the following question to mean? “Did you or any household member go a whole day and night without eating anything because there was not enough food?” When I say “whole day and night,” what do you think I mean? Is there a specific way to say this in the local language that makes the meaning clear?

Thank you for your time and input. This information will be very useful for the interviewers to help facilitate respondent recall. It will also help us to interpret the results across locations where customs may differ.

- iii. The key informant's suggestions for adapting changes and examples should be incorporated into the survey.
 - iv. Team members go to local stores and speak with community members to assess the availability and use of fortified food products.
3. Refining the Module
- i. Further key informant and community meetings are held that refine the food lists and translations. One person should lead the discussion in deciding the language to be used while another takes notes of what is discussed.
 - Select 6-8 individuals who are similar to the survey population but who will not be part of the survey sample
 - These individuals should be informed of the option to participate or not, and that they can choose to leave or refuse to answer a question at any time
 - Review the survey with the group
 - Based on information obtained from this process, further modifications may be made
 - ii. The final product of this step is a draft survey with locally relevant phrases and examples when necessary that can be tested with a group of respondents (step II).
4. Back-Translation of the Survey
- i. An independent translator who has no prior knowledge of the questions translates the survey back into English. The goal is to achieve conceptual equivalence of the original questions in the translated language.

5. Final translation of the questionnaire

- i. Once key informants from each locality have been visited, the food group lists have been completed and appropriate terminology has been agreed upon, a final version of the questionnaire in the official national language should be created.
- ii. This final version of the questionnaire in the official national language should then be translated into the local dialects.
- iii. It is recommended that the survey enumerators do not translate “on the spot” from one language to another, but that the questionnaire is translated and printed into each local language which will be used. The product of this step is ready to be pre-tested in the field.

II. Data Collection

The survey questions should be asked of the person who is responsible for food preparation, or if that person is unavailable, of another adult who was present and ate in the household the previous day. The enumerator attains consent from the interviewee. The questions refer to the household *as a whole*, so the respondent should be instructed to include the food groups consumed by any household members in the home, or prepared in the home for consumption by household members outside the home (e.g., at lunchtime in the fields.) Foods consumed outside the home that were not prepared in the home should not be included. However, in situations where consumption outside the home of foods not prepared in the household is common, survey implementers may decide to include those foods. Such decisions should be clearly documented, so that subsequent surveys will use the same protocol and to ensure correct interpretation and comparison.

Some questions may require that the interviewer read the locally appropriate definition of certain words (e.g., “household”) the first time these words are used in a question. These definitions are provided for the interviewer on the consent form. The interviewer may need to provide locally relevant examples when the respondent requires further prompting.

For the first section of questions, the respondent should reply “yes” or “no” and may recall the foods eaten from that food group. These should be noted next to the recorded answer (see example below). After having administered the full survey and before leaving the household, enumerators should check over the response format to ensure that all questions have been asked and that the responses are complete and legible.

III. Enumerator Training To be completed before data collection, if necessary

- i. Distribute the survey to the enumerators and have them read through it. Ask them what the survey is asking.
- ii. Review the questions and the definitions of key terms and concepts identified during the translation and adaptation process.
- iii. Review correct technique for administering the survey.
- iv. Have the enumerators practice on each other and document using the pre-determined template. Enumerators should not deviate from the survey questions. See the Template Example Below.

Date: Survey Group: Question #	August 4, 2012 Sammie Town Field Survey Response	CODE
1	Yes – bread, rice	1
2	Yes - cassava	1
3	No	0
3a	No	0
3b	Yes - mango	1
3c	Yes	1

- v. Discuss interview problems.
- vi. Do a role-play scenario for the interviewers.
- vii. For the second part of the survey (Q13,14,15):
 - a. The response options should be read only for the first question. The respondent should be allowed to answer in his or her own words. The enumerator will then select the most appropriate response option based on the respondent’s reply.
 - b. For instance if, after asking an occurrence question, the respondent says “no,” but adds that it only happened a few times, then the correct code is “1” (yes). The frequency-of-occurrence question should then be asked. If the respondent describes a frequency that would translate to “3–10 times” in the past 30 days, the correct response selection for the frequency-of-occurrence question is “sometimes,” and

the correct response code is “2.” If the respondent has difficulty replying, then the interviewer can encourage a response by listing the set of options again. The table below illustrates the example described above.

- viii. Students take home the survey and practice in their household. Also have them take home the consent form and practice attaining consent.
- ix. After, review issues or translation problems that were observed during survey administration and make necessary changes.

Coding Occurrence and Frequency-of-Occurrence Responses

No.	Question	Response Options	Code
Q13	Was there ever no food to eat of any kind in your house because of lack of resources to get food? Respondent Answer: No. Well, just a few times.	0 = No (skip to Q2) 1 = Yes	1
Q13a	How often did this happen in the past 30 days? Respondent Answer: Four, maybe five times	1 = Rarely (once or twice in the past 30 days) 2 = Sometimes (3–10 times in the past 30 days) 3 = Often (more than 10 times in the past 30 days)	2

IV. Data Entry Excel Spreadsheet example template:

Column	Column Label	Data Input/Function
A	Enumerator	Name of person who conducted interview
B	Cereals	Code
C	Roots and Tubers	Code
D	Vit A Vegetables	Code
E	Vit A Vegetable Products	Code
F	Other Vegetables	Code
G	Vegetables	=SUM(DRow#+ERow#+FRow#) / SUM(DRow#+ERow#+FRow#)
H	Vitamin A Fruits	Code
I	Other Fruits	Code
J	Fruits	=SUM(HRow#+IRow#) / SUM(HRow#+IRow#)
K	Organ Meats	Code
L	Other Meat and Poultry	Code
M	Meat and Poultry	=SUM(KRow#+LRow#) / SUM(KRow#+LRow#)
N	Eggs	Code
O	Fish and Seafood	Code
P	Pulses/Legumes/Nuts	Code
Q	Milk and Milk Products	Code
R	Red Palm Oil	Code
S	Oils/Other Fats	Code
T	Oils/Fats	=SUM(RRow#+SRow#)/SUM(RRow#+SRow#)
U	Sugars	Code
V	Misc	Code
W	Total Dietary Diversity Score	= SUM(B+C+G+J+M+N+O+P+Q+T+U+V)
X	Q1	Code
Y	Q1a	Code
Z	Q2	Code
AA	Q2a	Code
AB	Q3	Code
AC	Q3a	Code
AD	NewQ1	New Code
AE	NewQ2	New Code
AF	NewQ3	New Code
AG	Household Hunger Scale Score	= SUM (AD+AE+AF)

V. Data Tabulation

The first part of the survey is inquiring about the consumption of 12 food groups. The Household Dietary Diversity variable will therefore range from 0 to 12. A simple spreadsheet can be created to tabulate the total number of food groups consumed by members of the household (0-12). Response values for each group will be either 0 or 1.

Because this survey is expanded to include data on iron and vitamin A intake, some food groups (vegetables, fruits, meat and oil/fat) are divided into sub-groups. However, the response value for the 12 main food groups should reflect the aggregate response of the sub-groups so the total HDDS remains a 0-12 scale. For example, the fruits food group (inquired in questions 4a and 4b) is separated into vitamin A-rich fruits (4a) and all other fruits (4b). When tabulated, the overall intake of the fruit group will include 4a “any mango” and 4b “any other fruits like apples, banana, pear, guava, grapefruit, watermelon, pineapple or sweet sherp.” Therefore, if the respondent replies “yes” to either 4a or 4b, they have consumed fruits overall and the disaggregated response value will be 1.

To do this, combine the disaggregated vegetable, fruit, meat, and oil/fat groups into summary food groups (columns G, J, M, T). These groups will take the value of 1 if any of the disaggregated food groups were consumed; they will take the value of 0 if none of the disaggregated food groups were consumed.

Example:

Column	C	D	E	F
Label	3a. Vitamin A vegetables	3b. Vitamin A vegetable products	3c. Other vegetables	3. Vegetables
Value	1	0	0	1

If C=1, D=1, or E= 1, then F = 1

Compute this value for vegetables, fruits, meat and oil/fat. Then compute the total number of food groups consumed by members of the household.

$$\text{Sum} [B + C + G + J + M + N + O + P + Q + T + U + V]$$

In addition to this, the percent of households consuming vitamin A- and iron-rich foods can also be tabulated. This indicator can be calculated to quantify the proportion of households that are consuming these specific foods. *Vitamin A rich fruits, vegetables and tubers contain at least 130 mcg of Retinol Equivalent / 100 g where 1RE = 6 µg β-carotene and 12 µg of all other provitamin A carotenoids.

% of households that consume Vitamin A-rich vegetables or fruits	$\frac{\# \text{ of households where } D, H \text{ or } R = 1}{\text{total \# households}} \times 100$
% of households that consume Iron-rich foods	$\frac{\# \text{ of households where } K, N \text{ or } Q = 1}{\text{total \# households}} \times 100$

Lastly, the average HDDS indicator is calculated for the sample population.

$$\text{Average HDDS} = \frac{\text{Sum}(HDDS)}{\text{Total \# households}}$$

HDDS can then be divided into categories for more informed data analysis.

HDDS Categorical Indicator	Household Dietary Diversity Categories
0–3	Lowest Dietary Diversity
4 and 5	Medium Dietary Diversity
6–12	Highest Dietary Diversity

The second part of the survey uses a Household Hunger Scale (HHS) to determine the degree of hunger experienced in a household on a scale of 0 to 6. The HHS data can be analyzed to construct a categorical HHS indicator and a median HHS score for the study sample. Because the HHS score is generally not normally distributed, reporting or using the mean HHS score for analysis (e.g., in t-tests) is not recommended.

First, an HHS score must be tabulated for every household. This requires some recoding of the data collected:

Step 1. The first step is to recode the responses to each frequency-of-occurrence question from three frequency categories (“rarely,” “sometimes,” “often”) into two frequency categories (“rarely or sometimes” and “often”).

To avoid losing the original data collected, create a new variable for each frequency-of-occurrence question. Do not overwrite the original data. Here, we refer to the new variables created for each frequency-of-occurrence question as NewQ1, NewQ2, and NewQ3.

For each of the new variables created, a frequency response of “rarely” (originally coded as “1”) is coded as “1”; a frequency response of “sometimes” (originally coded as “2”) is coded as “1”; and a frequency response of “often” (originally coded as “3”) is coded as “2”.

Step 2. Next, add a code of “0” for households that replied “No” to each corresponding occurrence question. Once this step is completed, all households should have a value of 0, 1, or 2 for each of the three new variables created, NewQ1, NewQ2, and NewQ3.

The two parts of each HHS item are recoded into a single variable. The example below uses Q1 and Q1a from the HHS to demonstrate how to create and recode the data collected from Q1 and Q1a into a single variable.

Occurrence Question	Code for original variable	Code for new variable (NewQ1)
Q1. Was there ever no food to eat of any kind in your house because of lack of resources to get food?	0 (no) 1 (yes)	0 -
Frequency-of-Occurrence Question	Code according to frequency	
Q1a. How often did this happen in the past 30 days?	1 (rarely) 2 (sometimes) 3 (often)	1 1 2

Step 3. The values of NewQ1, NewQ2, and NewQ3 are then summed for each household to calculate the HHS score. If the tabulation has been carried out correctly, each household will have an HHS score between 0 and 6. These values are then used to generate the HHS indicators.

The three household hunger categories are shown below.

HHS Categorical Indicator	Household Hunger Categories
0–1	Little to no hunger in the household
2–3	Moderate hunger in the household
4–6	Severe hunger in the household

The median value is that which falls at the center of the score distribution for the sample. This value can be identified using a median function applied to the full sample of values in Microsoft excel, or through summary statistics of data analysis software.

This protocol was adapted from:

Ballard, Terri; Coates, Jennifer; Swindale, Anne; and Deitchler, Megan. *Household Hunger Scale: Indicator Definition and Measurement Guide*. Washington, DC: FANTA-2 Bridge, FHI 360.

Swindale, Anne, and Paula Bilinsky. Household Dietary Diversity Score(HDDS) for Measurement of Household Food Access: Indicator Guide (v.2). Washington, D.C.: Food and Nutrition Technical Assistance Project, Academy for Educational Development, 2006.

Coates, Jennifer, Anne Swindale and Paula Bilinsky. 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, August 2007.