Template for Requests for Revisions to the DHS Model Questionnaires, Optional Modules, and Biomarkers for DHS-8 (2018-2023)

Section I. Information about the requesting party

1. Is this request being submitted on behalf of a group? If so, please provide the name of the group and the participating parties.

This is on behalf of the *Center for Global Health* at Arizona State University.

Alexandra Brewis, Founding Director, Center for Global Health

Amber Wutich, Director, Center for Global Health.

Section II. Indicator definition and rationale

2. Please define the indicator or indicators you are requesting The DHS Program to incorporate. *Multiple indicators derived from a single set of questions should be included in the same submission.* (Response required)

We propose replacing one single question in DHS to provide *a summary assessment of* ***household water insecurity*****.** This would be part of **Water, Sanitation, and Hygiene** "water source" question block in the household questionnaire.

3. What is the rationale for measuring this indicator (each of these indicators) in DHS surveys? (Response required)

Water insecurity (lack of sufficient safe water to meet household nutritive, economic, and social needs) is increasingly demonstrated as a likely major driver of household wellbeing. It theoretically underpins infectious and probably also chronic disease risks, child feeding and food security, many other aspects of wellbeing and productivity, as well poverty itself. Better data on the role of water insecurity will provide increased knowledge of leverage points for household level health, economic, etc, interventions. The current DHS question set does not (and cannot be manipulated to) capture a global or summary assessment of household water insecurity. The current questions of 'water source' and 'time to fetch water' correlate to some extent with household water insecurity status, but less directly and clearly predict household vulnerabilities.

The existing "*In the past two weeks, was the water from this source not available for at least one full day?*" question (HH Q.106) may have been intended as a proxy for household water insecurity (?). But the current water security literature suggests this is not the best way to capture household water insecurity. The problem is that a response that water has been interrupted can mean many things – e.g., some households may have excellent storage and a one day interruption is predictable and has little impact. It also does not capture is people are getting enough *safe* water for household use, an important facet of water security that the literature shows strongly predicts health, economic, and other vulnerabilities.

Moreover, we just completed an extended analysis of most recent India and Nepal DHS data, showing all the water variables (water source, fetching time) – **except** HH Q. 106 meaningfully predicted lowered diversity of child feeding, earlier cessation of breastfeeding, stress markers like blood pressure, lowered wealth indices, etc. This is modeled, for example, in: Brewis, A., N. Choudhury, and A. Wutich. 2019. Low water access as a gendered physiological stressor: Blood pressure evidence from Nepal. *American Journal of Human Biology,* in press.

Section III. Proposed additions/revisions to the questionnaires or biomarkers

4. Please describe the requested addition or revision.
   If the requested change is the addition of new questions to the DHS questionnaires or modules, complete questions 4.1 and 4.1.1. If the requested change is a revision to existing questions, complete question 4.2. If the change relates to anthropometry or a biomarker, please complete question 4.3.

   4.1. **For additions**: If you have developed a question or set of questions to measure the indicator(s), please provide them in the space below or in a separate file attached with your submission.

SINGLE QUESTION OPTION:

Q1. Which of these four statements best describes your household water situation in the last 4 weeks (one month)?

A. We usually or always have enough water, and the water is good quality
B. We usually or always have enough water, but the water is poor quality
C. We rarely or never have enough water, but the water is good quality
D. We rarely or never have enough water, and the water is poor quality

TWO QUESTION OPTION
Q1. Which of these two statements best describes your household water situation in the last 4 weeks (one month)?

A. We usually or always have enough water
B. We rarely or never have enough water

Q2. Which of these two statements best describes your household water situation in the last 4 weeks (one month)?

A. Our water is good quality
B. Our water is poor quality

4.1.1 If requesting multiple questions, please specify the relative priority of each new question.

We would prefer the two question option because it is simpler for the respondents, but the one question option also works.

4.2. **For revisions to existing questions**: Please specify the DHS-7 question number, the proposed revision to the question, and the rationale.

DHS-7 question number	DHS-7 question text	Proposed new question	Rationale

4.3. **For anthropometry and biomarkers**: Please describe the measurement procedures or specimen collection procedures, point-of-care or laboratory testing procedures (as relevant), and any recommendations for return of results.

5. Can any related questions be deleted from the questionnaire to make room for the proposed new content? If so please specify which questions using the DHS-7 question numbers.

We suggest, as noted above, that DHS **delete HH Q. 106.** *In the past two weeks, was the water from this source not available for at least one full day?*

6. What are the implications of these requested changes on measurement of trends using DHS data?

We believe this change will create a new summary "household water insecurity" indicator, better able to capture household vulnerabilities related to water in ways they can also then better predict how water is undermining other aspects of health and wellbeing (such as risk of diarrheal disease, undermining household diets, creating additional economic stress, etc).

Section IV. Indicator calculation

7. Indicate how to calculate the indicator(s). Include detailed definitions of the numerator and denominator of each individual indicator. If you have developed a tabulation plan for the indicator(s), please attach a file including the suggested table(s) with your submission.

The question responses could be treated as a two or four category variable.

ONE QUESTION OPTION

Two category

Response 1A [water secure household]

Response 1B or 1C or 1D. [water insecure household]

OR

Four category

Response 1A = [water secure household]

Response 1B = [water insecure household – quantity]

Response 1C = [water insecure household – quality]

Response 1D = [water insecure household – quantity and quality]

TWO QUESTION OPTION

Two category

Response 1A *and* 2A [water secure household]

Any other response set [water insecure household]

OR

Four category

Response 1A *and* 2A = [water secure household]

Response 1B and 2A = [water insecure household – quantity issues]

Response 1A and 2B = [water insecure household – quality issues]

Response 1B and 2B = [water insecure household – quantity and quality issues]

8. Is the indicator useful when measured at the national level, or is it useful only when disaggregated to specific subnational areas, such as endemicity zones or project intervention regions?

   For each indicator, select one of the three options by clicking in the appropriate box.

Indicator	Useful only for subnational endemicity zones or project intervention regions. A single estimate at the national level is not meaningful.	Useful at both national and subnational regions, as sample size allows.	Useful only at the national level. Subnational estimates are not needed.
HH water insecurity	☐	☒	☐

Section V. Prior testing of the proposed question(s)

9. Have the proposed questions undergone any formal validation; i.e., have the questions been tested against a "gold standard" to assess their accuracy? If yes, please describe how well or poorly the questions performed and/or provide a publication or report of the validation exercise (or a link).

One challenge is that there is easy way to good standard household water insecurity, as we have explained elsewhere.

Jepson, W. E., **Wutich**, A., Colllins, S. M., Boateng, G. O., & Young, S. L. (2017). Progress in household water insecurity metrics: a cross-disciplinary approach. *Wiley Interdisciplinary Reviews: Water*, *4*(3), e1214.

One of the proposers here (Wutich) developed the first published water insecurity scale (for Bolivia) in the early 2000s and has been the primary academic authority on water scale development since. See:

Wutich, A., & Ragsdale, K. (2008). Water insecurity and emotional distress: coping with supply, access, and seasonal variability of water in a Bolivian squatter settlement. *Social science & medicine*, *67*(12), 2116-2125.

Hadley, C., & **Wutich, A**. (2009). Experience-based measures of food and water security: biocultural approaches to grounded measures of insecurity. *Human Organization*, 451-460.

We have continued to refine and validated the screener questions in our own research across multiple contexts in the years since, including Paraguay, Ecuador, Fij, Guatemala. Some publications form studies where we have deployed the proposed question as a summary assessment of household water security are:

Wutich, A, A. Brewis, A. York, R. Stotts, and C. Roberts. 2012. Shared cultural norms for justice in water institutions: Results from Fiji, Ecuador, Paraguay, New Zealand, and the U.S. *Journal of Environmental Management* 113: 370-6.

Brewis, A., A. Wutich, M. DuBray, R. Schuster, J. Maupin, and M. Gervais. 2019. Community hygiene norm violators are consistently stigmatized: Evidence from four global sites and implications for sanitation interventions. *Social Science and Medicine* 220:12-21.

DuBray, M., A**. Wutich,** K. Larson, D. White, A. **Brewis**. 2018. Anger and sadness: Emotional geographies of climate threats in four island nations. *Cross-Cultural Research* doi.org/10.1177/1069397118759252

Du Bray, M., A. W**utich**, K. Larson, D. White, and **A. Brewis**. 2017. Emotion, coping, and climate change in island nations: Implications for environmental justice. *Environmental Justice* 10(4):102-107.

We most recently applied the screener in a large USAID funded baseline survey of lower income areas in **Haiti** (N=4069), and found it strongly predicted all the domains expected, including food insecurity (HFIAS) and material poverty (using DHS Wealth Index questions). That analysis is currently under peer review. In 2018 we collected detailed household level post-disaster survey data in Puerto Rico using the same screener and again found it highly predicted exactly what it should, including emotional suffering and activation of household and community-level coping responses.

NB: Here our goal however is a simple, summary 1-2 question means to assess household water insecurity; but we have been collaborating extensively and closely as members of the team developing the 12 item cross-culturally validated household water insecurity scale to ensure appropriate collaboration (the scale is not yet published, but under review). See: Young, S. L., Collins, S. M., Boateng, G. O., Neilands, T. B., Jamaluddine, Z., Miller, J. D. **Brewis, A**., … **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), bmjopen-2018.

10. Have the questions undergone any other kind of testing; e.g., cognitive testing, pilot testing. If so, please describe the results of the testing and/or provide a publication or report of the findings (or a link).

Yes, in multiple rounds of interviews in multiple countries we always employ cognitive testing and piloting of questions. We have tried an array of 1 and 2 question versions over the 15 years (see publications above for examples) before we settled on the current proposed one.

Section VI. Other considerations

11. Please provide information relevant to the kinds of questions below, and/or anything else you wish to share with us about this indicator (these indicators).

- Describe how the data for this indicator are being used (or will be used).
  - Are the data produced by this indicator actionable?
  - Who will use the data?

Development practitioners, policy makers, and academics. Currently there is no trans-national, intra-national or temporal tracking in changes in household water insecurity; this would provide a simple but effective means to identify what is considered a major rising global challenge. Currently, development practitioners have little means to assess how water (quality as well as quantity) especially contributes to other household vulnerabilities, and 'time to fetch water' and 'water source' are very indirect ways to assess what is actually happening in the household (so findings are difficult to interpret). There is a widening academic focus on understanding the production and consequences of household water insecurity, and the data will connect water variables to other aspects of health and wellbeing in ways not currently possible.

- What kinds of decisions will be made using these data?

For development, for example, the data will be usable to identify the distribution in space and time in terms of household vulnerability (tracking) and also to identify leverage points for local or national interventions. For example, to model whether providing clean or more water would be likely to shift after vulnerabilities (such as lack of household wealth or food insecurity, child diarrheal risk, etc)

- For what kinds of countries would the indicator(s) be most useful?

Our efforts have always extended across both lowest to highest income nations; the tool is specifically designed to work across a full range of settings. The format given (quantity+ quality) also works well across both urban and rural households.

- Does the DHS survey offer any particular advantage over other available data sources for measuring this indicator? If so, what?

Yes, the sampling and consistency of DHS data collection through time and across space gives an unprecedented basis for recognizing and addressing the changing risks of water shortages within and across regions.