

USER MANUAL

# Household Water Insecurity Experiences Scale



Household  
Water  
InSecurity  
Experiences

## SCALE USAGE PERMISSION

The Household Water Insecurity Experiences (HWISE) Scale was developed with support from the Competitive Research Grants to Develop Innovative Methods and Metrics for Agriculture and Nutrition Actions (IMMANA). IMMANA is funded with UK Aid from the UK government. The HWISE Research Coordination Network was supported by the National Science Foundation (grant number BCS-1759972). As such, the HWISE Scale is in the public domain and freely available for use.

## RECOMMENDED CITATION

We request that individuals who use the scale please cite the following publication as the source of the scale: Young SL, Boateng GO, Jamaluddine Z, Miller JD, et al. (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*. doi: 10.1136/bmjgh-2019-001750.

To maintain implementation fidelity, we request that individuals do not alter the scale beyond the suggested modifications outlined in this manual. Any modifications made to the HWISE Scale should be specified in any written reports and publications.

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## 1.0 BACKGROUND: WHY ANOTHER MEASUREMENT OF WATER?

Human health is predicated on water. Problems with water availability (shortage, flooding), access (affordability, reliability), and contamination (chemical, pathogens) directly contribute to the global burden of disease.<sup>1-3</sup>

Water problems are projected to become more frequent and severe due to climate change, unequal resource distribution, and persistent degradation of water quality and infrastructure.<sup>4-6</sup> As such, national institutions and international agencies have declared meeting the challenges of declining and inequitable water supplies to be an urgent priority.<sup>4,5</sup> Further, safe water in sufficient quantities is implicated in most of the Sustainable Development Goals.

Progress towards equitable and sufficient water has been primarily measured by per capita availability,<sup>7</sup> or the proportion of the population with access to safely managed drinking water (*figure 1*).<sup>8</sup> These measures have been enormously helpful, e.g., in tracking progress towards the Sustainable Development Goals.

However, existing indicators:

- do not capture the many ways that water access can be problematic, e.g. if available water is accessible or sufficient for the many uses of water in households
- mask differences within populations, e.g. by gender, age, ethnicity
- cannot quantify the individual health, economic, and psychosocial burdens of water problems

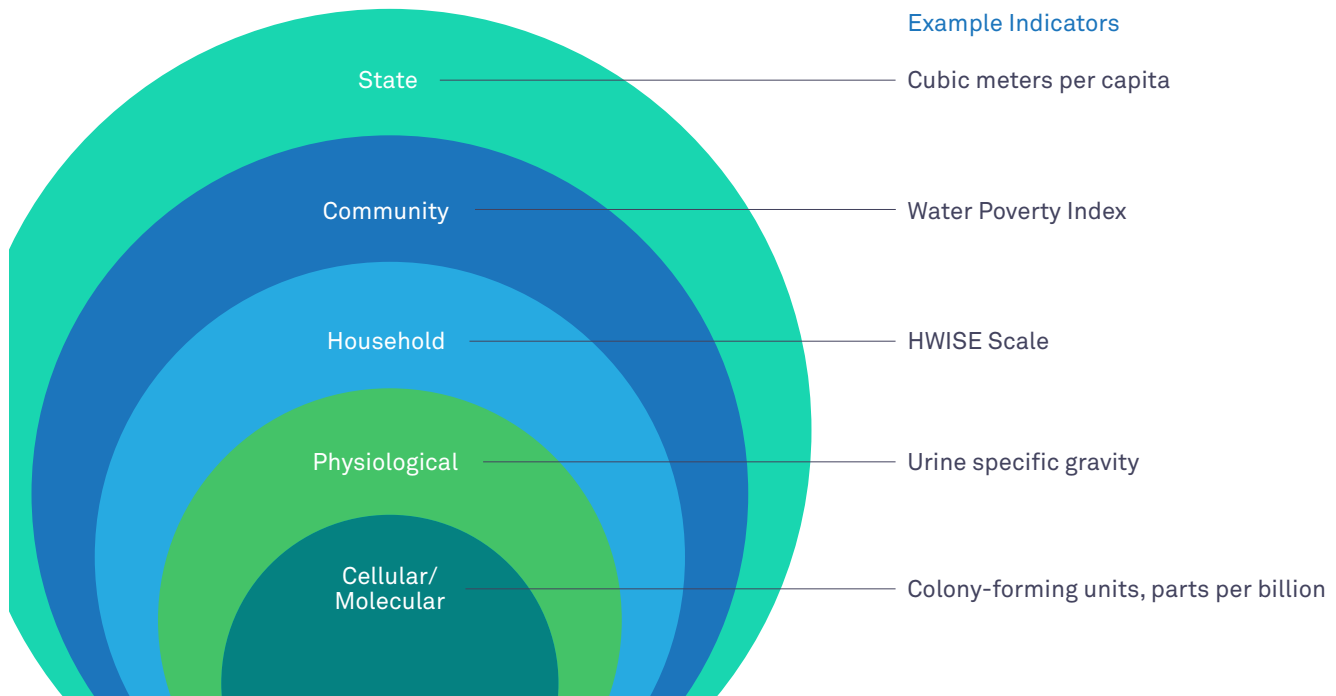
*Our inability to measure the causes and consequences of water on human health in a cross-culturally valid way is a significant scientific gap that has spurred calls for higher-resolution data.<sup>3,5</sup>*

**box 1** Definition of household water insecurity.

Household water insecurity is a condition when affordability, reliability, adequacy, and/or safety is significantly reduced or unattainable so as to threaten or jeopardize well-being, which includes physical and mental health and the capacity to undertake necessary productive, social, and cultural activities.<sup>9</sup>

Household water insecurity, defined as the inability to access and benefit from affordable, adequate, reliable and safe water for wellbeing and a healthy life, is a concept that captures the multiple dimensions of water acquisition and use at the level at which they are experienced.<sup>9</sup> Given that it is a complex concept, household water insecurity has been difficult to measure equivalently across cultures.

## WATER METRICS BY SOCIO-ECOLOGICAL LEVEL



*figure 1* There has been a gap in metrics to evaluate the experiences of household of water insecurity.

To address this global challenge, a consortium of over 40 international scholars collected data from over 8,000 households in 28 sites across 23 low- and middle-income countries to develop the Household Water Insecurity Experiences (HWISE) Scale ([hwise.org](http://hwise.org)). This tool is cross-culturally validated and produces equivalent scores across diverse ecological settings in order to identify where and when water insecurity occurs, as well as who is water insecure and to what extent.<sup>10</sup>

The HWISE Scale has many uses:

- identify populations vulnerable to water insecurity
- understand causes and consequences of water insecurity
- track trends in household water insecurity over time
- monitor and evaluate the impact of water policies and programs

This manual provides guidance on how to adapt, implement, and interpret results generated from the HWISE Scale. The HWISE Scale asks respondents to reflect on experiences of water availability, accessibility, use, acceptability, and reliability throughout the prior four weeks. The HWISE Scale assumes that households with greater water insecurity will affirm more experiences and/or affirm greater frequency of experiences. Information on the development, implementation, and validation of the HWISE Scale can be found elsewhere.<sup>11</sup>

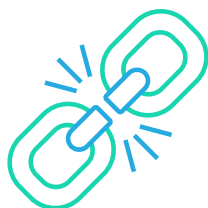
## 2.0 HWISE SCALE ITEMS

Each item is phrased to capture experiences that anyone in the household has had in the last four weeks.

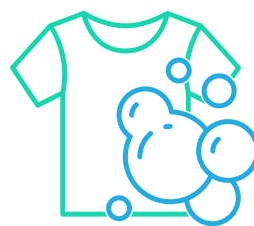
There are 12 HWISE items (*figure 2*). Responses to items are: never (0 times), rarely (1–2 times), sometimes (3–10 times), often (11–20 times), and always (more than 20 times). Never is scored as 0, rarely is scored as 1, and sometimes is scored as 2. Often and always are both scored as 3.



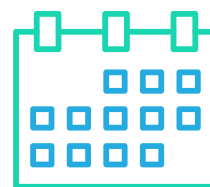
WORRY



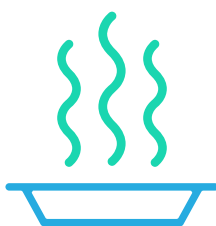
INTERRUPT



CLOTHES



PLANS



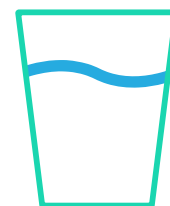
FOOD



HANDS



BODY



DRINK



ANGRY



SLEEP



NONE



SHAME

*figure 2* Icons and labels for each HWISE scale item.

LABEL	ITEM	SCORE
 Worry	In the last 4 weeks, how frequently did you or anyone in your household <b>worry</b> you would not have enough water for all of your household needs?	<hr/>
 Interrupt	In the last 4 weeks, how frequently has your main water source been <b>interrupted</b> or limited (e.g. water pressure, less water than expected, river dried up)?	<hr/>
 Clothes	In the last 4 weeks, how frequently have problems with water meant that <b>clothes</b> could not be washed?	<hr/>
 Plans	In the last 4 weeks, how frequently have you or anyone in your household had to <b>change schedules or plans</b> due to problems with your water situation? (Activities that may have been interrupted include caring for others, doing household chores, agricultural work, income-generating activities, sleeping, etc.)	<hr/>
 Food	In the last 4 weeks, how frequently have you or anyone in your household had to <b>change what was being eaten</b> because there were problems with water (e.g., for washing foods, cooking, etc.)?	<hr/>
 Hands	In the last 4 weeks, how frequently have you or anyone in your household had to go without washing <b>hands</b> after dirty activities (e.g., defecating or changing diapers, cleaning animal dung) because of problems with water?	<hr/>
 Body	In the last 4 weeks, how frequently have you or anyone in your household had to go without washing their <b>body</b> because of problems with water (e.g., not enough water, dirty, unsafe)?	<hr/>
 Drink	In the last 4 weeks, how frequently has there not been as much water to <b>drink</b> as you would like for you or anyone in your household?	<hr/>
 Angry	In the last 4 weeks, how frequently did you or anyone in your household feel <b>angry</b> about your water situation?	<hr/>
 Sleep	In the last 4 weeks, how frequently have you or anyone in your household gone to <b>sleep</b> thirsty because there wasn't any water to drink?	<hr/>
 None	In the last 4 weeks, how frequently has there been <b>no useable or drinkable water</b> whatsoever in your household?	<hr/>
 Shame	In the last 4 weeks, how frequently have problems with water caused you or anyone in your household to <b>feel ashamed</b> /excluded/stigmatized?	<hr/>

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TOTAL

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## 3.0 IMPLEMENTING THE SCALE

### In what order should the items be asked?

We encourage implementers to work with key informants in order to identify the severity and sensitivity of items. Previous research demonstrates that organizing items in order of increasing severity or sensitivity produces more reliable responses. As such, items may be asked in different orders across sites of implementation.

### Who should answer these questions?

Any adult who considers themselves knowledgeable about water acquisition and use among all members of their household can answer. Remember, items address the situation of all household members, not just the individual who is responding. These items have not yet been validated with children.

### What is a household?

The definition of a household is highly context specific. Survey implementers should develop a standard definition that is appropriate for the local area in which the scale is being used, e.g., “a household includes all people who sleep under the same roof and share food from the same pot.” This definition should be stated at the start of each interview, and respondents should affirm that they understand this definition.

### Can any items be dropped?

No. The module should be asked in its entirety. Our previous work demonstrates that the complete set of questions more comprehensively and robustly measures the multiple dimensions of household water insecurity than any single question on its own. Dropping questions means scores will not be comparable across settings and studies.

### Why was a 4-week recall period selected?

Problems with water (e.g., water shut-offs) are not necessarily experienced daily. Therefore, we used a 4-week recall period to better capture a household’s experiences with water insecurity. Previous water insecurity work has demonstrated that a 4-week retrospective recall is reliable.<sup>10</sup> We plan to explore a longer recall period in the near future.

### What if a participant responds with “don’t know” to an HWISE Scale item?

“Don’t know” is coded as missing. Given that HWISE Scale scores can only be generated if households answer all 12 questions, implementers should use suggested probes (see Section 5.0) to ensure that the respondent does know how frequently an experience occurs in their household. If someone who is more knowledgeable about the household’s water situation is available and consents to participate, their responses should be recorded instead.

### What if a participant responds with “not applicable” to an HWISE Scale item?

“Not applicable” is coded as missing. However, given that HWISE Scale items were developed to be universally applicable across diverse ecological and cultural settings, respondents should be able to answer all questions.<sup>10</sup> Implementers should use suggested probes (see Section 5.0) to ensure that participants understood the experience described before recording a response as “not applicable.” If respondents frequently report “not applicable”, feel free to be in touch.



#### 4.0 ADAPTING THE HWISE SCALE TO LOCAL CONTEXT

## For all surveys, both correct linguistic and contextual translation is important.

The questions in the HWISE Scale are worded to be as universally relevant as possible. Certain questions contain phrases, however, that may need to be adapted to the local context to ensure that respondents know their meaning. Some questions require that the interviewer read a locally appropriate definition (e.g., of ‘household’) the first time these words are used in a question. Further, certain questions may require that the interviewer provide locally relevant examples when the respondent requires further prompting (see section 5.0).

It is critical that the intended meaning of the items is conveyed to ensure that HWISE Scale scores are equivalent and comparable. In order to adapt the phrases, definitions, and examples to the local context, and to ensure that questions are understood appropriately, questions should be reviewed with a group of key informants and then refined with a small group of respondents before implementation. Cognitive interviews, focus group discussions, back translation, and field pre-testing are common methods for identifying potential mis-translations and other errors. For a more in-depth discussion of scale adaptation, please see.<sup>13,14</sup>



Enumerator training and pre-testing of items in Lagos, Nigeria.

## 5.0 PROBING QUESTIONS FOR THE HWISE SCALE

For each item in the HWISE Scale, we suggest using the following probing questions to help convey the underlying intention of each item.



### WORRY

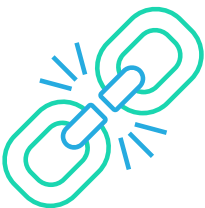
In the last 4 weeks, how frequently did you or anyone in your household **worry** you would not have enough water for all of your household needs?

Your household needs could include washing clothes, bathing yourself and/or your children, watering animals, washing dishes and utensils, cleaning your home, or other activities that require water.

In this question, we are wondering about the worry of not having enough water.

### TIP

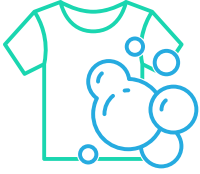
If participants do not feel confident in their answers, or are having a difficult time responding, probe the participant about how many times these items have occurred in one week. Multiply this number by four to get a cumulative response.



### INTERRUPT

In the last 4 weeks, how frequently has your main water source been interrupted or limited (e.g. water pressure, less water than expected, river dried up)?

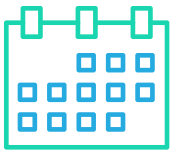
There are many types of interruptions. By interrupted, we mean that your water could have been turned off by the government or company that provides it. It could have stopped flowing due to issues with the supply or supplier, a storage tank no longer containing water, or the vendor you regularly use to purchase water from not being available. Or perhaps there is a drought and the spring you normally use is dry such that you have to use another source to get water. This item does not exclusively refer to piped water sources.



### CLOTHES

In the last 4 weeks, how frequently have problems with water meant that clothes could not be washed?

This question refers only to water for washing clothes. Water used for laundry can come from within the household or outside the household (e.g. at a tapstand or river).



### PLANS

In the last 4 weeks, how frequently have you or anyone in your household had to change schedules or plans due to problems with your water situation? (Activities that may have been interrupted include caring for others, doing household chores, agricultural work, income-generating activities, sleeping, etc.)

This question refers to your day being interrupted by problems with water. In some places, people have to travel to get water, which takes time and can interrupt plans. Interruptions include if you want to go visit a friend but cannot because you have to go get water, waking in the middle of the night to get water, or because there are problems caused by flooding that you have to deal with instead.



### FOOD

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.)?

This question refers to water only used for cooking or preparing foods. This question means that your household may have changed what was eaten because there was not enough water to wash, prepare, or cook a preferred food. For example, you couldn't wash vegetables, or didn't have enough water to boil beans.



### HANDS

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?

This question refers to water for washing hands. Sometimes you may need to do dirty/unclean activities like changing diapers, using a toilet, smearing mud or dung on walls or floors to insulate your home, cleaning, or taking care of animals, and you may not have enough water to wash your hands after. If you choose not to wash your hands, this is different than not having enough water to wash them.

**BODY**

In the last 4 weeks, how frequently have you or anyone in your household had to go without washing their body because of problems with water (e.g., not enough water, dirty, unsafe)?

This question refers to anyone in the household not being able to wash their body because there isn't enough water for bathing. Sometimes household members need to bathe, but there isn't enough clean water to do so. Or, there may be enough water for some members of the family to bathe but not others.

**DRINK**

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?

This question refers to drinking water in your household. In some places, there is not always enough water for everyone to drink as much as they would like. Or, there may be drinking water for some people, but not others.

**ANGRY**

In the last 4 weeks, how frequently did you or anyone in your household feel angry about your water situation?

This question refers to anger or other negative emotions you feel because of getting and using water. By your water situation, we mean how you get water, not having enough water, not having enough of the kinds of water you prefer, being worried about the quality of your water, water issues affecting your life and schedule, and anything else related to getting and using water that may cause you to feel angry.

**SLEEP**

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?

This question refers to not having enough water to drink in your household and feeling thirsty when you are going to sleep. For example, people can go many hours without drinking water because they do not have enough, they are saving it for other household members, or the water available isn't suitable for drinking.



### NONE

In the last 4 weeks, how frequently has there been no useable or drinkable water whatsoever in your household?

This question refers to not having any water in your household that can be used for household activities or for drinking. For example, in some places, people do not have enough storage to keep water or are unable to get enough water to have for immediate needs as well as to store for later needs. In other places, water may be flooding a home, but none of the water that has gone into the house is useful for drinking, washing, cooking, or other activities.



### SHAME

In the last 4 weeks, how frequently have problems with water caused you or anyone in your household to feel ashamed/excluded/stigmatized?

There are many reasons why people might feel ashamed, excluded, or stigmatized because of problems with water. This could include not being able to provide visitors with water if they stop by your home or feeling unclean due to lack of water.



## 6.0 DATA QUALITY AND IMPLEMENTATION FIDELITY



Data collection in Kathmandu, Nepal.

The HWISE Scale can be implemented using paper forms or tablet-based surveys. Administration of the scale requires approximately 3-5 minutes per household. Before leaving the household, interviewers should check over the survey to ensure that all questions have been asked, and that the responses are complete and legible.

Sometimes it can be difficult to remember details about a household or community once data collection is complete. **Field notes provide a glimpse into the household and allow the interviewer to articulate his or her experiences.** As you go into communities, it may

be useful to carry a notebook and pencil with you so you can write down any observations about the community as a whole. These may include sources of water, if it is raining outside, what the houses within the community look like, how interviews are perceived, and anything you notice during implementation.

### TIP

If a participant responds with “don’t know” or “not applicable”, use probes (see Section 5.0) to ensure that he or she understood the intent of the question.

## Calculating water insecurity scores for households

HWISE Scale **scores are calculated by summing responses to each question** (figure 3). Four response categories are used:

- never (0 times) is scored as 0
- rarely (1-2 times) is scored as 1
- sometimes (3-10 times) is scored as 2
- often and always (more than 10 times) are both scored as 3

Scores range from 0-36, where higher scores indicate greater water insecurity.<sup>10</sup> If a participant responded with “don’t know” or “not applicable” to any item, a score cannot be generated for their household.

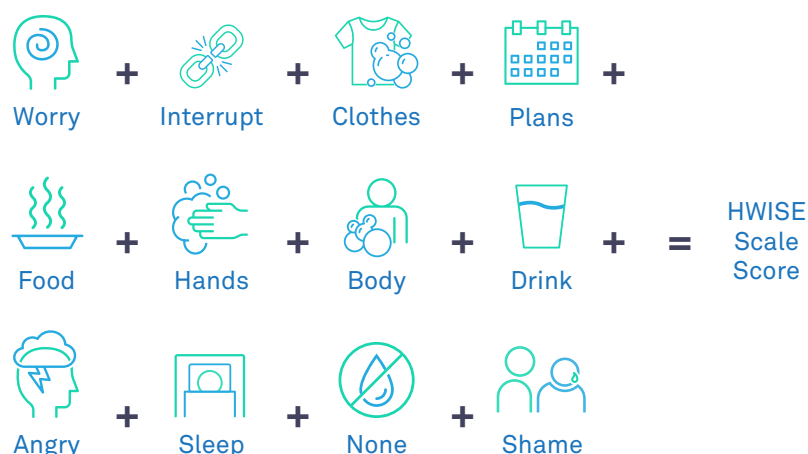


figure 3 HWISE Scale scores require the summation of all 12 item questions.

## Calculating proportion of water-insecure households

We have developed a provisional cut-point for water-insecure households, such that **households with a HWISE Scale score of 12 or higher are considered water insecure**. Based on previous work, water-insecure households compared to households classified as water secure at this cut-point had lower satisfaction with their water situation, as well as higher perceived stress and food insecurity. A cut-point of 12 also distinguished between subpopulations with expected differences in water insecurity within sites, e.g., households within and outside refugee camps in Beirut, Lebanon.<sup>10</sup>

$$\frac{\text{Number of households with HWISE scores } \geq 12}{\text{Total number of households}} = \text{Proportion of water-insecure households}$$

figure 4 The proportion of water-insecure households is calculated by dividing the number of households with scores of 12 or higher by the total number of households.

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## GET INVOLVED

Development and validation of the HWISE Scale is only one step toward understanding and mitigating water insecurity. The HWISE Scale must be widely implemented in order to generate data that help to understand and monitor the prevalence, etiologies, and consequences of household water insecurity. As problems with water become more common and severe, the data the HWISE Scale generates can guide the international community's ambitious development agenda by contributing an evidence base for clinical, public health, and policy recommendations regarding water.

To learn more, visit our site ([hwise.org](http://hwise.org)). To get involved, please contact:

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[hwise.rcn@gmail.com](mailto:hwise.rcn@gmail.com)  
[hwise-rcn.org](http://hwise-rcn.org)

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