



The Household Water InSecurity Experiences (HWISE) Scale: development, validation, and implementation of a household water insecurity measure for low- and middle- income countries

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1. Why is measuring experiences with water important?
2. What were the gaps in previous measurements?
3. What is the HWISE Scale?
4. What will implementing the HWISE Scale tell us?



Water is life...

... and life depends on water

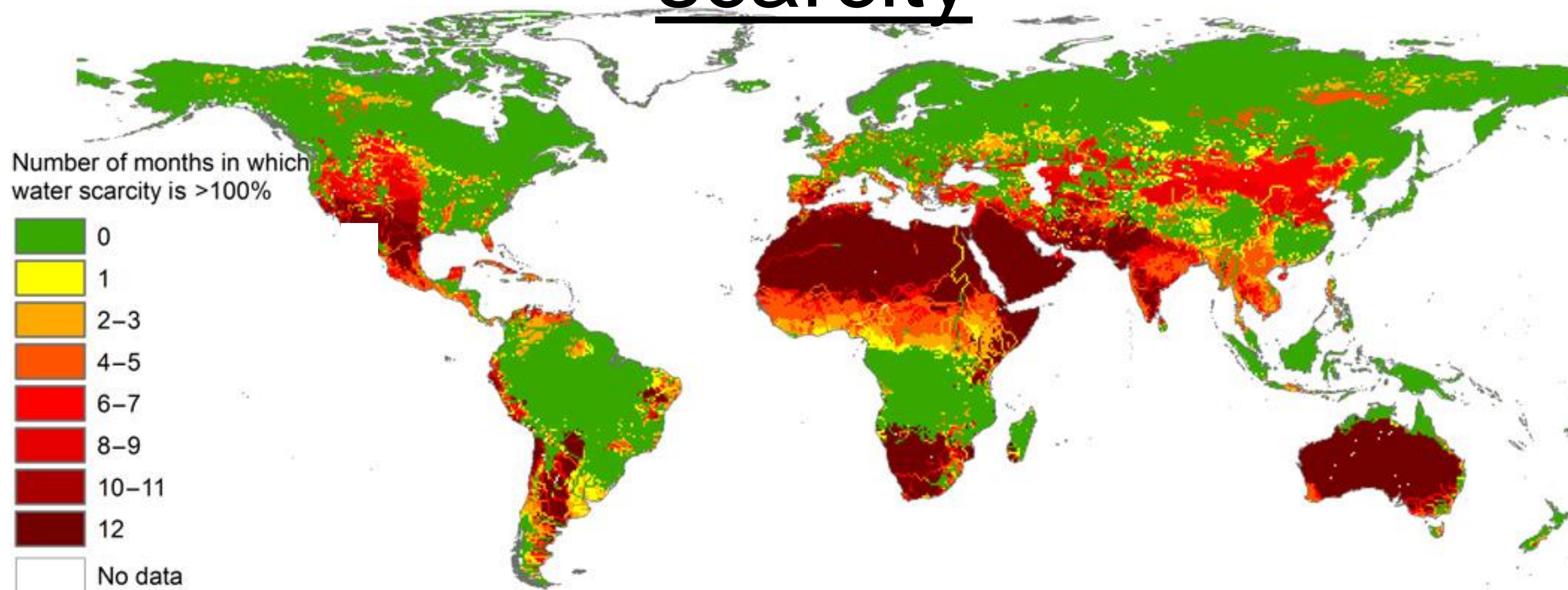








4 billion face water scarcity



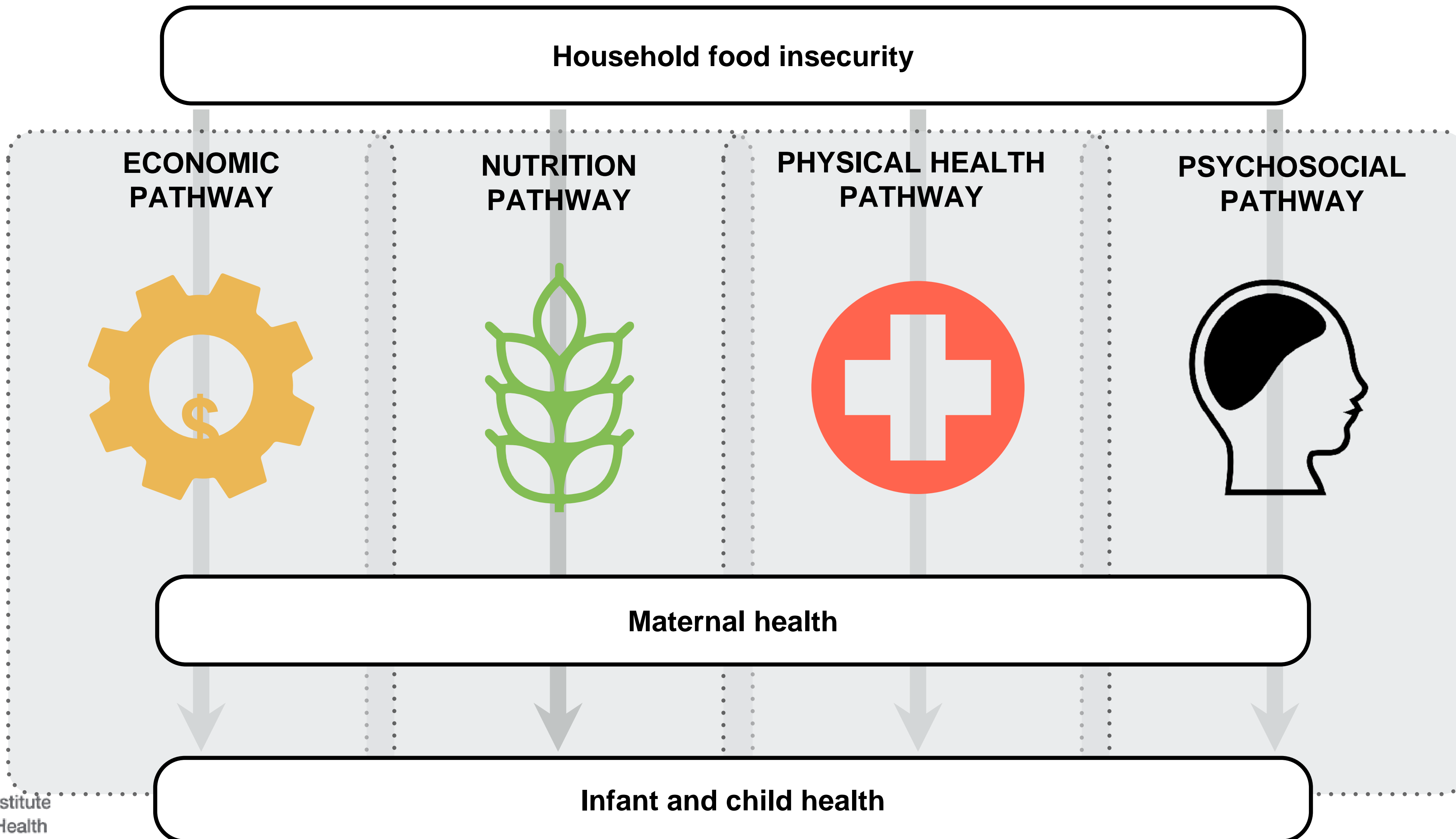
Mekonnen & Hoekstra (2016)

...and many more face water
excess and/or poor water
quality



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Food insecurity in the 1st 1,000 days



Measuring Household Food Insecurity

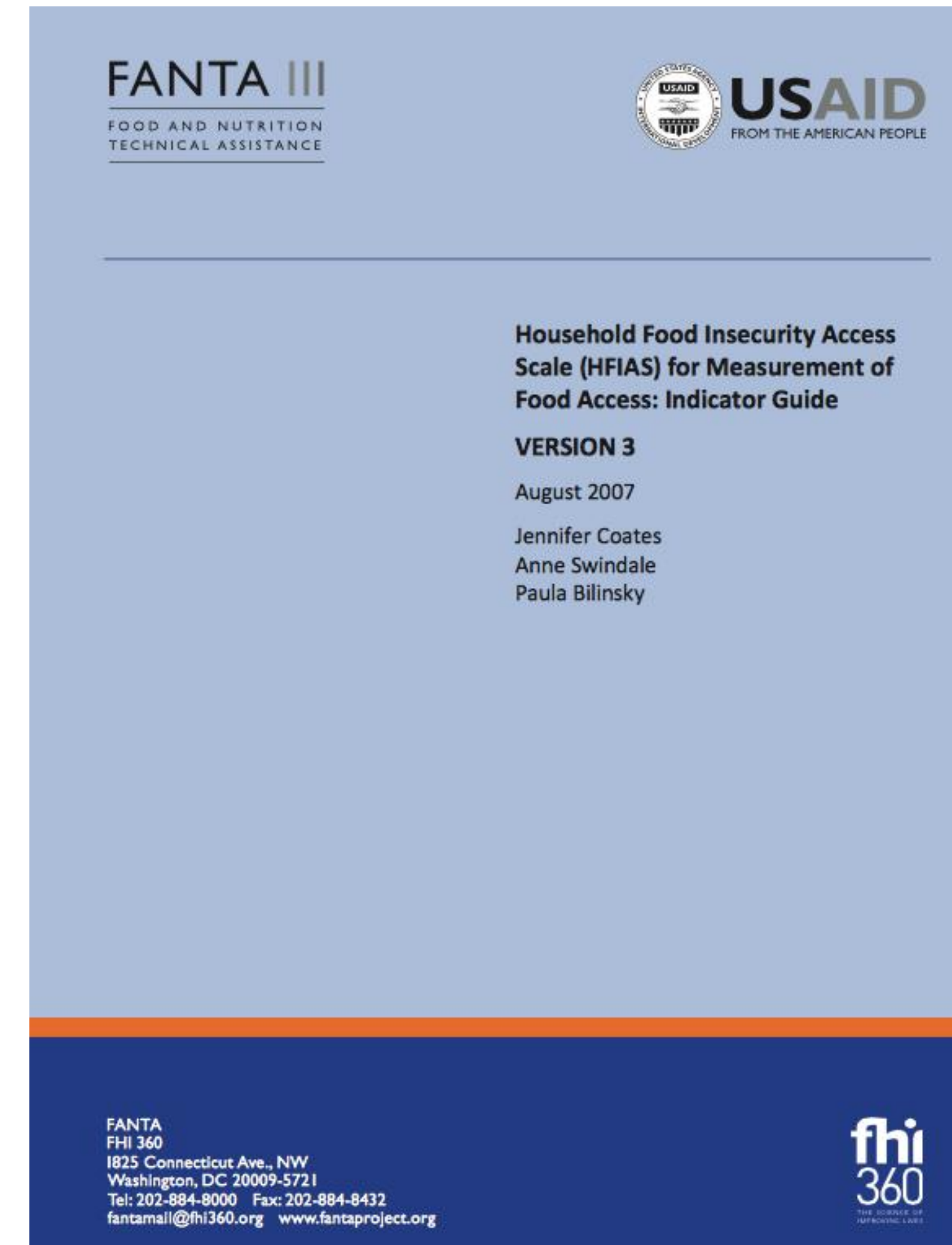
In the last month, how frequently has anyone in your household...

...worried about having enough to eat

...skipped meals

...went for a day & night without eating

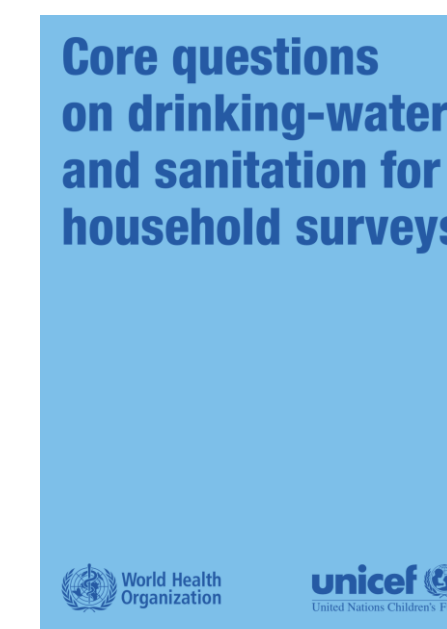
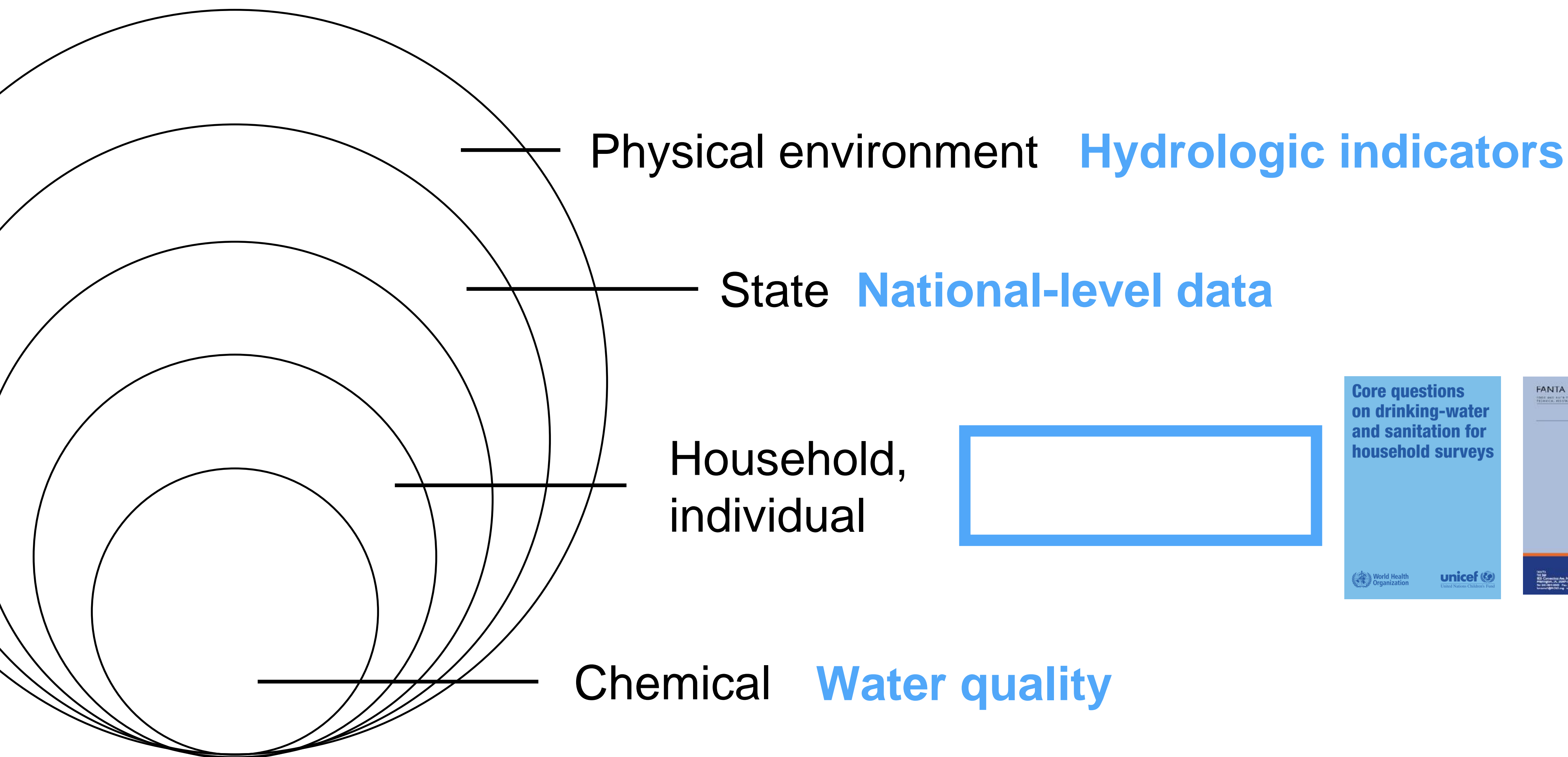
Scoring: Never (0), rarely (1), sometimes (2), often (3). Range of 0-27.



“What shapes how you feed your infant?”



Existing measures of water fell short



We needed an analogous scale for water experiences

U.S. ADULT FOOD SECURITY SURVEY MODULE: THREE-STAGE DESIGN, WITH SCREENERS Economic Research Service, USDA September 2012

Revision Notes: The food security questions in the U.S. Adult Food Security Survey Module are essentially unchanged from those in the original module first implemented in 1995.

September 2012:

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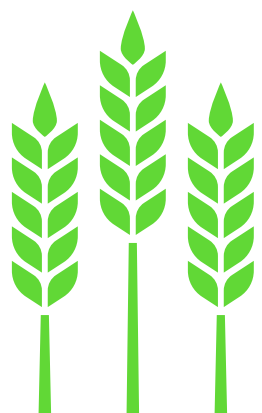
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Overview: The U.S. Adult Food Security Survey Module is the same set of questions that is administered as the U.S. Household Food Security Survey Module to households with no child present. For many measurement purposes, the adult module can be used both for households with and without children present.

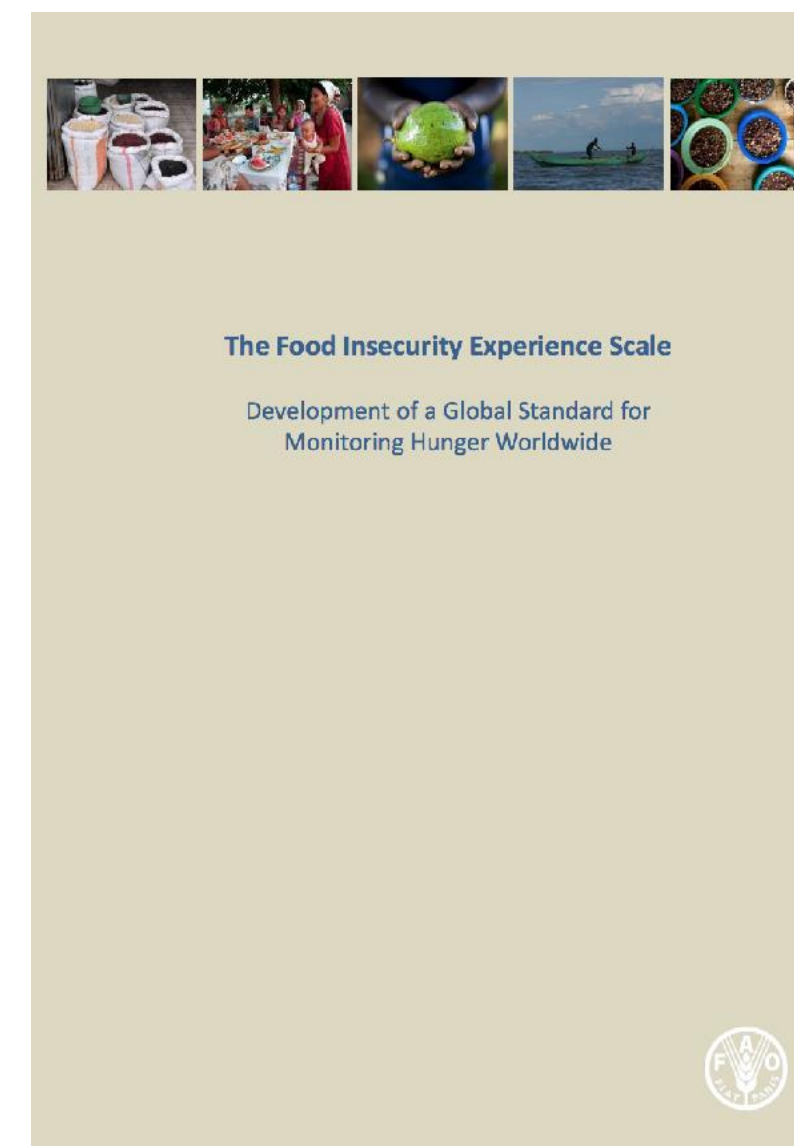
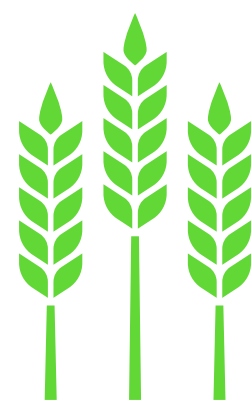
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- Advantages (compared with the 18-item household module):
 - Less respondent burden.
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 - Avoids asking questions about children’s food security, which can be sensitive in some survey contexts.

USDA: Food Security Module



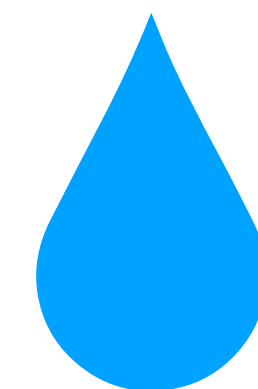
USAID: Household Food Insecurity Access Scale



FAO: Food Insecurity Experiences Scale



Household Water Insecurity Experiences Scale





1. Why is measuring experiences with water important?
2. What were the gaps in previous measurements?
3. **What is the HWISE Scale?**
4. What will implementing the HWISE Scale tell us?



Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer

Godfred O. Boateng^{1*}, Torsten B. Neilands², Edward A. Frongillo³,
Hugo R. Melgar-Quinonez⁴ and Sera L. Young^{1,5}

Open access

Protocol

BMJ Open Development and validation protocol for an instrument to measure household water insecurity across cultures and ecologies: the Household Water InSecurity Experiences (HWISE) Scale

Sera L Young,¹ Shaleen M Collins,² Godfred O Boateng,² Torsten B Neilands,³ Zeina Jamaluddine,⁴ Joshua D Miller,² Alexandra A Brewis,⁵ Edward A Frongillo,⁶ Wendy E Jepson,⁷ Hugo Melgar-Quinonez,⁸ Roseanne C Schuster,⁵ Justin B Stoler,⁹ Amber Wutich,⁵ on behalf of the HWISE Research Coordination Network

Assimilated items from site-specific scales + ethnography

initially 32 items

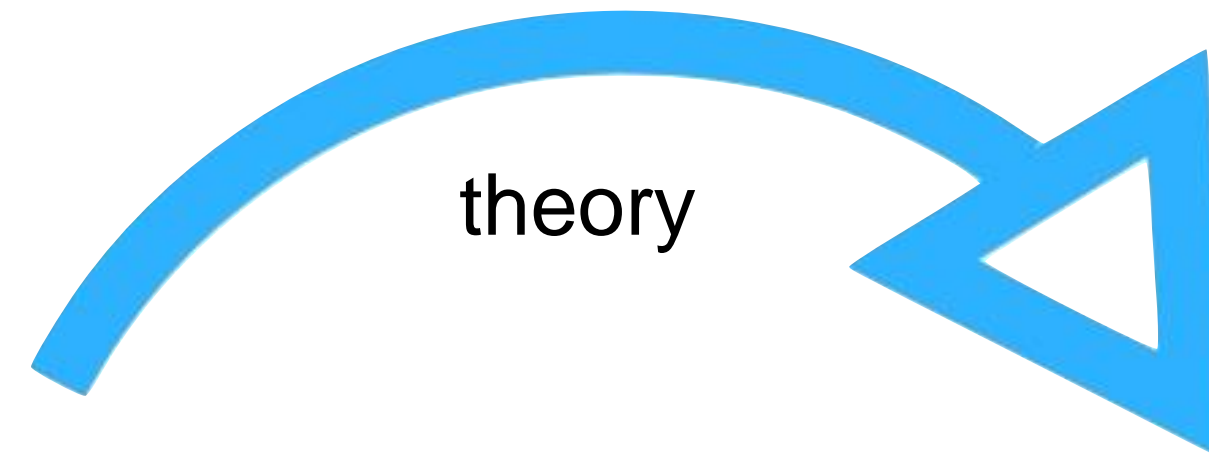
3. Household Water Insecurity Access Scale (32 items) <i>Now I'm going to ask you about your own personal experiences with water. For each of the items, please indicate how many times within the past 4 weeks or 30 days. Interviewer, please mark the response that best corresponds with the coding classification. For example, if participants says 15 times, you need to mark/circle code 3</i>		
Code name	Question	Coding Classification
WIAS1	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?	A....Never (0 times in the last 4 weeks) B....Rarely (1–2 times in the last 4 weeks) C....Sometimes (3–10 times in the last 4 weeks) D....Often (11-20 times in the last 4 weeks) E....Always (More than 20 times in the last 4 weeks) DK....Don't know NA...Not applicable/I don't have this
WIAS2	In the last 4 weeks, how frequently have you or anyone in your household worried about the safety of the person getting water for your household? <i>By getting, I mean: traveling to, collecting the water, and returning with the water.</i>	A....Never (0 times in the last 4 weeks) B....Rarely (1–2 times in the last 4 weeks) C....Sometimes (3–10 times in the last 4 weeks) D....Often (11-20 times in the last 4 weeks) E....Always (More than 20 times in the last 4 weeks) DK....Don't know NA...Not applicable/I don't have this
WIAS3	In the last 4 weeks, how frequently have you or anyone in your household thought of leaving [<i>name of town</i>] because there was no water there?	A....Never (0 times in the last 4 weeks) B....Rarely (1–2 times in the last 4 weeks) C....Sometimes (3–10 times in the last 4 weeks) D....Often (11-20 times in the last 4 weeks) E....Always (More than 20 times in the last 4 weeks) DK....Don't know NA...Not applicable/I don't have this
WIAS4	In the last 4 weeks, how frequently has your household water supply from your main water source been interrupted ?	A...Never (0 times in the last 4 weeks) B...Rarely (1–2 times in the last 4 weeks) C...Sometimes (3–10 times in the last 4 weeks) D...Often (11-20 times in the last 4 weeks) E... Always (More than 20 times in the last 4 weeks) DK...Don't know NA...Not applicable/I don't have this

WIAS5	In the last 4 weeks, how frequently has your household not had enough water for your garden, crops, or fruit trees ?	A....Never (0 times in the last 4 weeks) B....Rarely (1–2 times in the last 4 weeks) C....Sometimes (3–10 times in the last 4 weeks) D....Often (11-20 times in the last 4 weeks) E....Always (More than 20 times in the last 4 weeks) DK....Don't know NA....Not applicable/I don't have this
WIAS6	In the last 4 weeks, how frequently has your household not had enough water to give to your animals and poultry ?	A....Never (0 times in the last 4 weeks) B....Rarely (1–2 times in the last 4 weeks) C....Sometimes (3–10 times in the last 4 weeks) D....Often (11-20 times in the last 4 weeks) E....Always (More than 20 times in the last 4 weeks) DK....Don't know NA....Not applicable/I don't have this
WIAS7	In the last 4 weeks, how frequently has the time spent getting water prevented you or anyone in your household from earning money (e.g. engaging in paid work, economic activities)?	A...Never (0 times in the last 4 weeks) B...Rarely (1–2 times in the last 4 weeks) C...Sometimes (3–10 times in the last 4 weeks) D...Often (11-20 times in the last 4 weeks) E... Always (More than 20 times in the last 4 weeks) DK...Don't know NA...Not applicable/I don't have this
WIAS8	In the last 4 weeks, how frequently have you or anyone in your household lacked money needed to buy water?	A...Never (0 times in the last 4 weeks) B...Rarely (1–2 times in the last 4 weeks) C...Sometimes (3–10 times in the last 4 weeks) D...Often (11-20 times in the last 4 weeks) E... Always (More than 20 times in the last 4 weeks) DK...Don't know NA....Not applicable/I don't have this
WIAS9	In the last 4 weeks, how frequently did you or anyone in your household want to buy water but there was nowhere to buy it from ?	A...Never (0 times in the last 4 weeks) B...Rarely (1–2 times in the last 4 weeks) C...Sometimes (3–10 times in the last 4 weeks) D...Often (11-20 times in the last 4 weeks) E... Always (More than 20 times in the last 4 weeks) DK...Don't know NA....Not applicable/I don't have this
WIAS10	In the last 4 weeks, how frequently has the time spent getting water prevented you or anyone in your household from caring for children in the household ?	A...Never (0 times in the last 4 weeks) B...Rarely (1–2 times in the last 4 weeks) C...Sometimes (3–10 times in the last 4 weeks) D...Often (11-20 times in the last 4 weeks) E... Always (More than 20 times in the last 4 weeks) DK...Don't know NA...Not applicable/I don't have this
WIAS11	In the last 4 weeks, how frequently has the time spent getting water prevented you or anyone in your household from doing household chores (such as cooking, preparing food, washing clothes, etc.)?	A...Never (0 times in the last 4 weeks) B...Rarely (1–2 times in the last 4 weeks) C...Sometimes (3–10 times in the last 4 weeks) D...Often (11-20 times in the last 4 weeks) E... Always (More than 20 times in the last 4 weeks) DK...Don't know

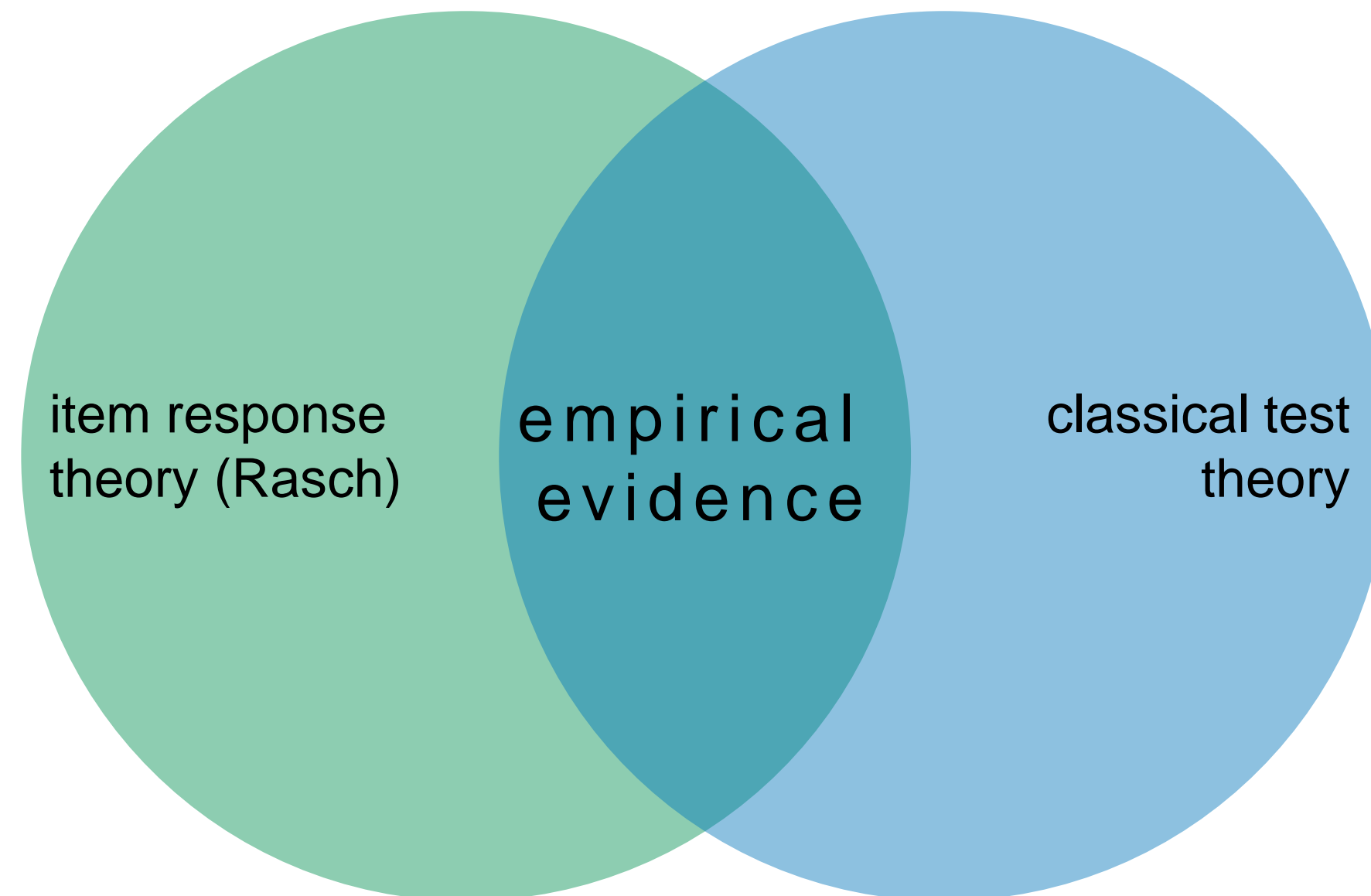
Survey implemented in 28 sites, across 8,127 households



*HWISE sites were selected for maximal heterogeneity in **region** of the world, **infrastructure**, and **problems with water***








Item reduction



...to 12 items.

How often in the last month have you or anyone in your HH...

Item	Item
 <p>...worried you would not have enough water for all of your household needs?</p>	 <p>...gone without washing their body because of problems with water (e.g. not enough water, dirty, unsafe)?</p>
 <p>...main water source been interrupted or limited (e.g. water pressure, less water than expected, river dried up)?</p>	 <p>...not been as much water to drink as you would like for you or anyone in your household?</p>
 <p>...there not been enough water to wash clothes?</p>	 <p>...feel angry about your water situation?</p>
 <p>...changed schedules or plans due to problems with your water situation?</p>	 <p>...gone to sleep thirsty because there wasn't any water to drink?</p>
 <p>...changed what was being eaten because there were problems with water (e.g. for washing foods, cooking, etc.)?</p>	 <p>... had no useable or drinkable water whatsoever in your household?</p>
 <p>...gone without washing hands after dirty activities because of problems with water?</p>	 <p>Problems with water caused you or anyone in your household to feel ashamed/excluded/stigmatized?</p>

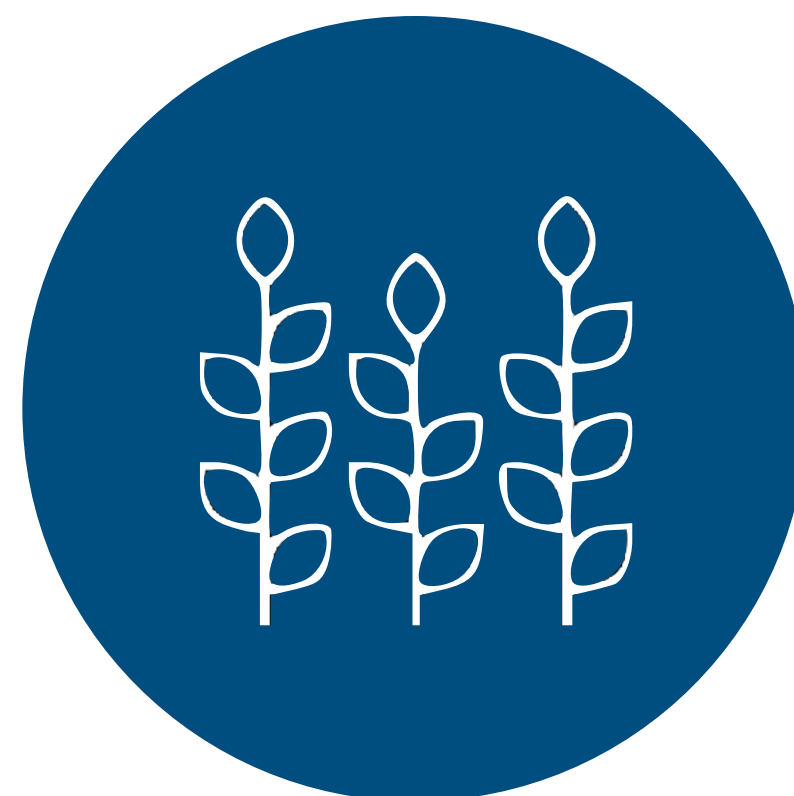
The HWISE Scale is **valid**



*Higher HWISE Scale scores
associated with...*



↑ *stress*



↑ *food
insecurity*



↑ *time to
collect water*

Invariant: scores are equivalent across sites



Punjab, Pakistan



Kathmandu, Nepal



Kisumu, Kenya

Scale now ready for broad implementation



2018 UN panel called for higher-resolution data



WATER ACTION DECADE

"This is an opportunity to raise awareness, define a roadmap and advance the water agenda."

António Guterres, Secretary-General of the United Nations

1 Understand Water

The adage “you can’t manage what you can’t measure” is particularly true for water. Information about water quantity, quality, distribution, access, risks, and use is essential for effective decision-making, whether by businesses managing a production process, rural communities managing a well or basin authorities managing a flood. Yet major gaps in water data and decision-making systems exist in many places, driven by a failure to invest in or maintain hydro-meteorological (‘hydromet’) equipment and other water data. In some parts of the world hydromet systems are degrading just as water pressures are growing. In addition, where water data does exist it is often difficult for stakeholders to access.



1. Why is measuring experiences with water important?
2. What were the gaps in previous measurements?
3. What is the HWISE Scale?
4. **What will implementing the HWISE Scale tell us?**

What will HWISE tell us?

- 1. assess prevalence; identify vulnerable populations



GALLUP POLL®
World Poll



UNESCO ambassador to UN at
HWISE launch in DC February 2019

The official global data on household water security



The World Poll is the only global survey infrastructure used to measure and track progress on three Sustainable Development Goal (SDG) indicators:

- Food Insecurity (SDG 2.1.2) for FAO;
- Financial Inclusion (SDG 8.1.2) for the World Bank;
- Modern Slavery (SDG 8.7) for ILO/Walk Free.

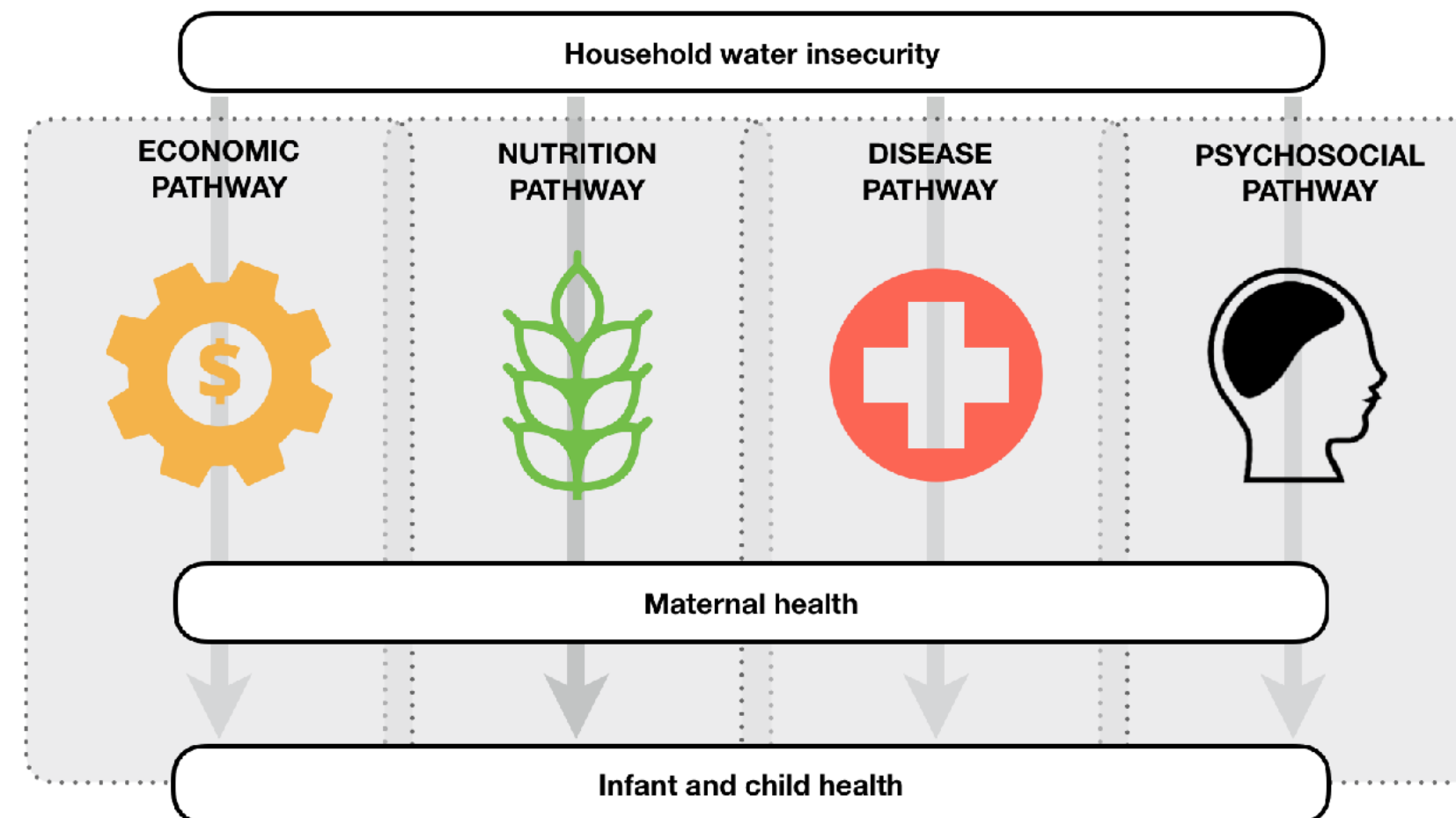
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1. assess prevalence; identify vulnerable populations



GALLUP POLL[®]
World Poll

2. determine consequences



The science is wide-open

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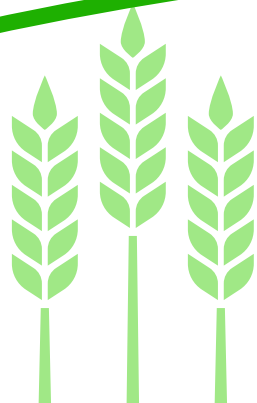
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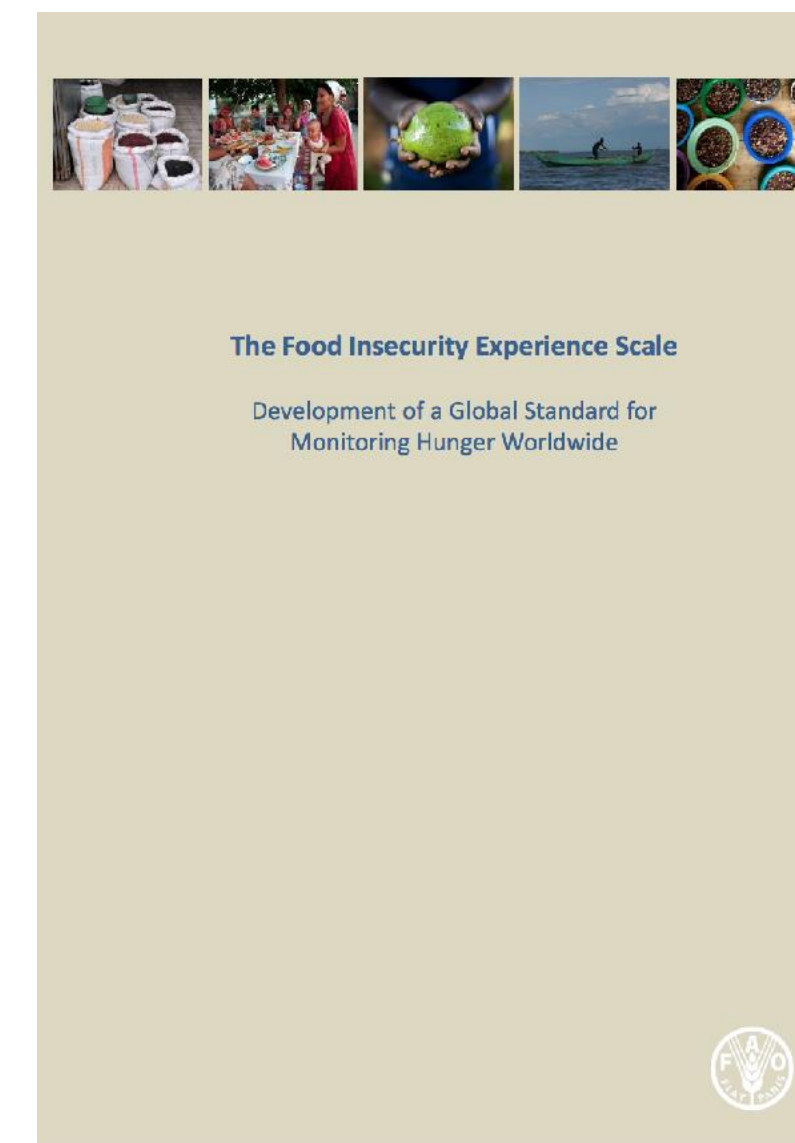
15,900 references



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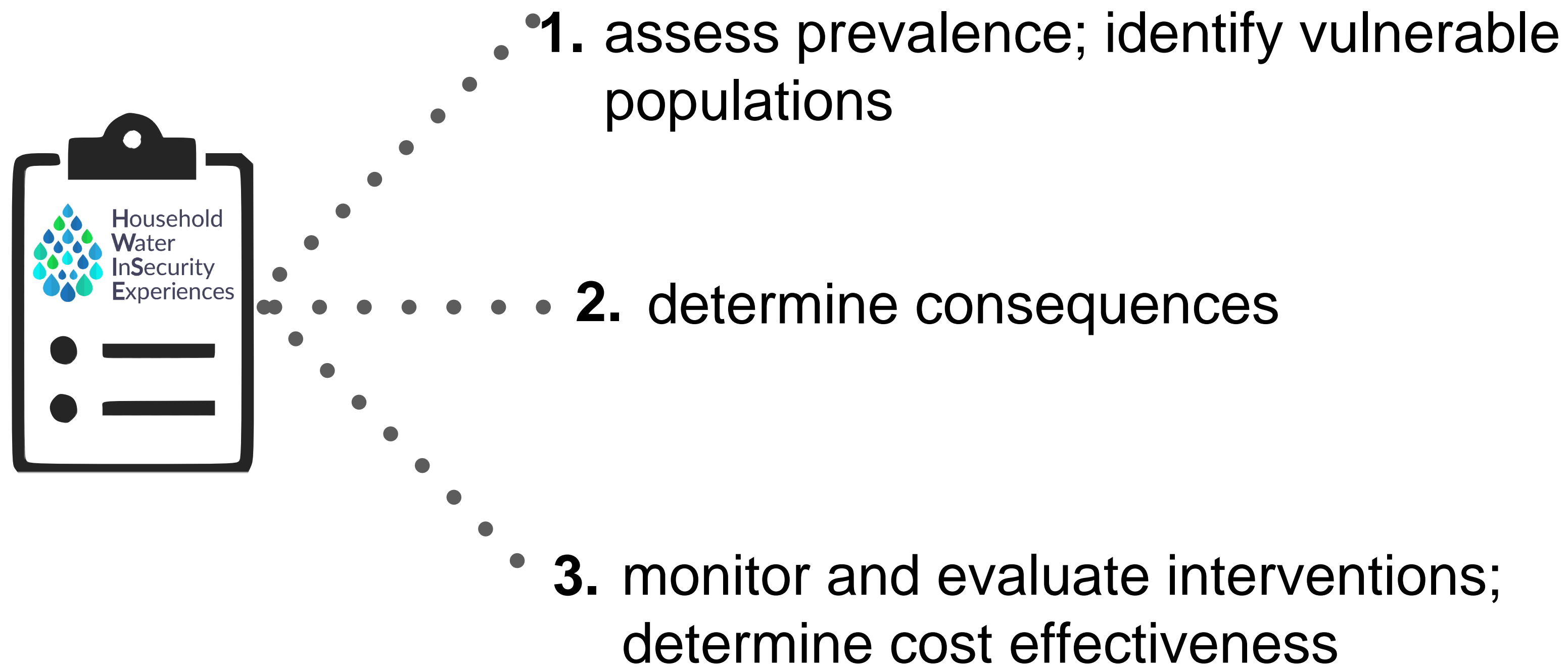


Household Water Insecurity Experiences Scale

180 references



What will HWISE tell us?



ipa
INNOVATIONS FOR
POVERTY ACTION



OXFAM

**LAST
MILE
HEALTH**

**WATER
WITNESS
INTERNATIONAL**



**ACTION
AGAINST
HUNGER**

WaterAid

In Zambia, higher HWISE scores predicts poorer health



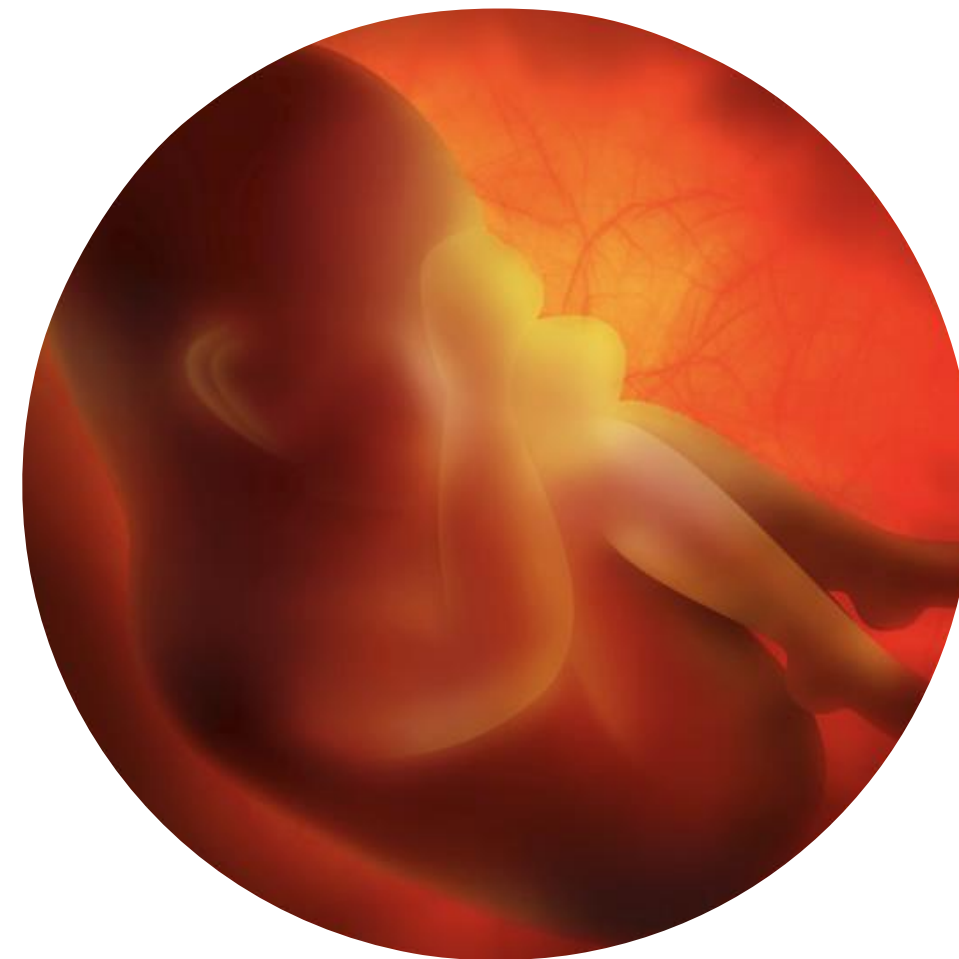
Well-Being Indicators	Correlation
Overall health	-0.18***
Unwell: normal activities interrupted	-0.11***
Impact by cholera outbreaks	-0.17***

* p<0.05; ** p<0.01; *** p<0.001





Household
Water
InSecurity
Experiences





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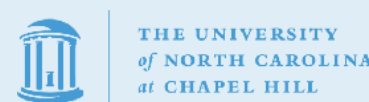
NUTRITION



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University of the West of England



GLOBAL HEALTH & DEVELOPMENT

Funders & Collaborators

The logo for immana, featuring the word in a white, lowercase, handwritten-style font on a blue background.

Innovative Methods and Metrics for
Agriculture and Nutrition Actions

