



# Measuring “Transformative WASH”

**An Explorative Conversation around  
WASH Outcome and Impact Indicators**

**Aleisha Elliott**

**Living Water International**

**One Accord Conference 2025**

**WASH & Public Health Intensive**



# **Definition of “Transformative”**

**Causing or able to cause an important and lasting change in someone or something**

**-Merriam-Webster**



# Latrines May Not Improve Health of Poor Children

OCTOBER 27, 2014

**Global Health**

By DONALD G.  
McNEIL Jr.

Because of the well-known dangers of open defecation — especially for children’s health — bringing millions of latrines to the poor has long been a goal of public health experts.

But now a major study in India has stunned advocates of latrine building by showing that it may do little good.

Researchers supported by the Bill & Melinda Gates Foundation, the International Initiative for Impact Evaluation and the London School of Hygiene & Tropical Medicine picked 100 villages in the Odisha state of India with a total of 51,000 inhabitants and built large numbers of latrines in half of them. They focused on reaching households with young children.

# Sanitation Hygiene Infa Nutrition Efficacy (S Trial in Zimbab



**NULL**

Andrew Prendergast  
Queen Mary University of London  
Zvitambo Institute for Maternal and Child Health Research, Zimbabwe



2018

# The MapSan Trial

A controlled before-and-after  
study of shared sanitation  
Maputo, Mozambique

Joe Brown  
Olivier



LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE

WSP  
Water & Sanitation for the Urban Poor



THE UNIVERSITY OF NORTH CAROLINA at CHAPEL HILL



**Three high-profile randomized control trials - measuring the benefits of WASH improvements on the physical health of children**

**- All found to be largely ineffective or mixed results**

Open Access


BMJ  
open

Cluster-randomized trials of individual-level water, sanitation and nutritional interventions in rural Bangladesh and Kenya: WASH Benefits study design and rationale

**MIXED**

2018

## Effects of water, sanitation, and hygiene interventions on detection of enteropathogens and host-specific faecal markers in the environment: a systematic review and individual participant data meta-analysis

[Andrew Mertens, PhD](#) <sup>a</sup>  · [Benjamin F Arnold, PhD](#)<sup>d</sup> · [Jade Benjamin-Chung, PhD](#)<sup>e</sup> · [Prof Alexandria B Boehm, PhD](#)<sup>f</sup> · [Joe Brown, PhD](#)<sup>i</sup> · [Drew Capone, PhD](#)<sup>j</sup> · et al. [Show more](#)

### Interpretation

The small effect of these sanitation interventions on pathogen detection and absence of effects on human or animal faecal markers are consistent with the small or null health effects previously reported in these trials. Our findings suggest that the basic sanitation interventions implemented in these studies did not contain human waste and did not adequately reduce exposure to enteropathogens in the environment.



**Is SDG 6 attainable?**

**Does it even matter?**

**What's a MEL officer to do?**





# Effectiveness of interventions to improve drinking water, sanitation, and handwashing with soap on risk of diarrhoeal disease in children in low-income and middle-income settings: a systematic review and meta-analysis



*Jennyfer Wolf, Sydney Hubbard, Michael Brauer, Argaw Ambelu, Benjamin F Arnold, Robert Bain, Valerie Bauza, Joe Brown, Bethany A Caruso, Thomas Clasen, John M Colford Jr, Matthew C Freeman, Bruce Gordon, Richard B Johnston, Andrew Mertens, Annette Prüss-Ustün, Ian Ross, Jeffrey Stanaway, Jeff T Zhao, Oliver Cumming, Sophie Boisson*

## Summary

**Background** Estimates of the effectiveness of water, sanitation, and hygiene (WASH) interventions that provide high levels of service on childhood diarrhoea are scarce. We aimed to provide up-to-date estimates on the burden of disease attributable to WASH and on the effects of different types of WASH interventions on childhood diarrhoea in low-income and middle-income countries (LMICs).

*Lancet* 2022; 400: 48–59

This online publication has been corrected. The corrected version first appeared at [thelancet.com](https://www.thelancet.com) on July 21, 2022

# Summary

Most  
effective at  
reducing  
child diarrhe  
a

**Improved water on premises, higher quality – 52%**

**Point-of-use water treatment through filtration – 50%**

**Safely managed sanitation – 47%**

**Point-of-use water treatment through solar treatment – 37%**

**Point-of-use water treatment through chlorination – 34%**

**Handwashing promotion – 30%**

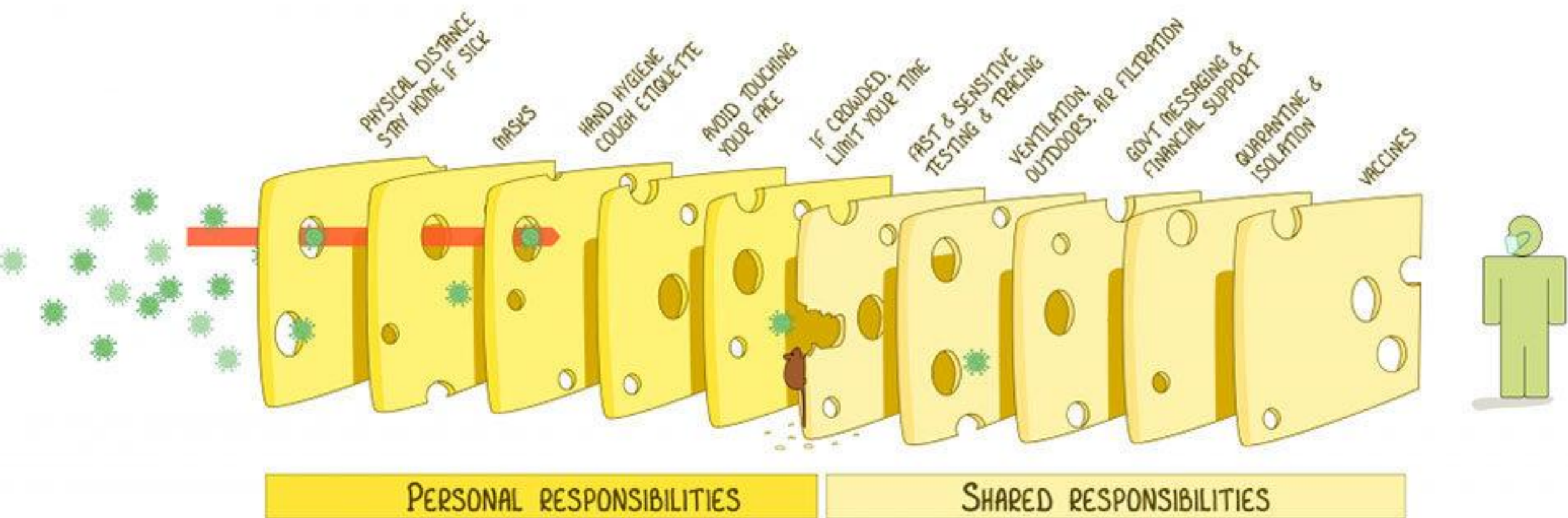
**Basic sanitation – 21% OR Improved water on premises – 21%**

**Improved water off premises – 19%**

Less  
effective at  
reducing  
child diarrhe  
a

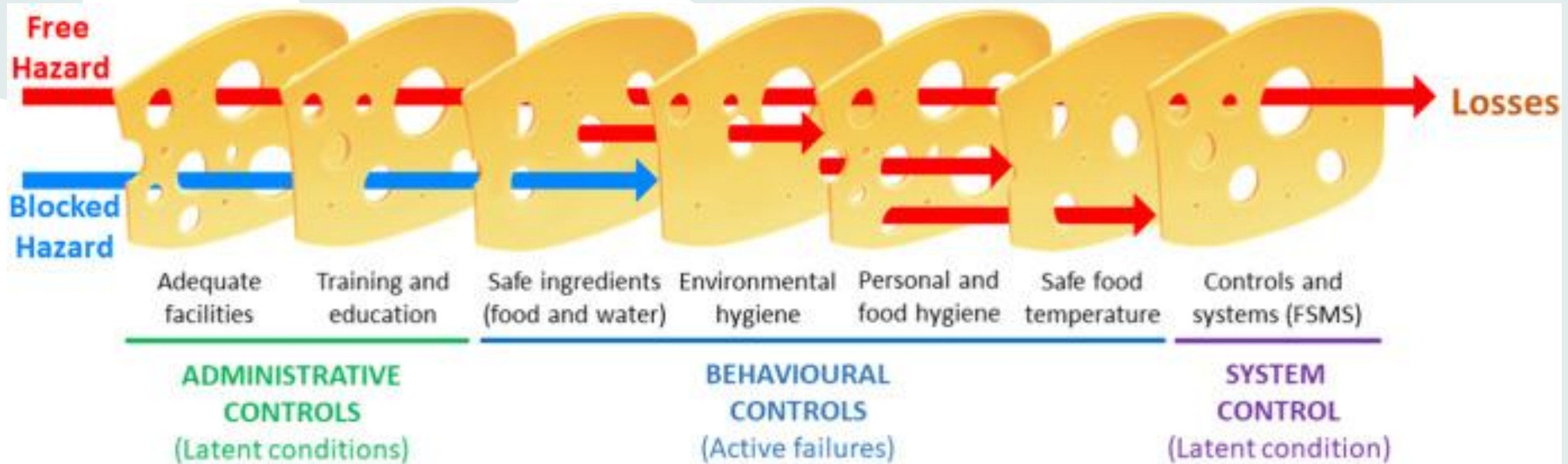
# THE SWISS CHEESE RESPIRATORY VIRUS PANDEMIC DEFENCE

RECOGNISING THAT NO SINGLE INTERVENTION IS PERFECT AT PREVENTING SPREAD



EACH INTERVENTION (LAYER) HAS IMPERFECTIONS (HOLES).  
MULTIPLE LAYERS IMPROVE SUCCESS.

# Swiss Cheese model for Food Safety



[Thimoteo da Cunha, et al., 2022](#)

It can be a challenge for WASH programs to address all the “holes” in the environment

# Living Water WPA impact results on Diarrhea

Since 2019

15 Evaluations (13 endlines and 2 midlines)

6 Decrease

6 measured decrease in diarrhea reported in past 2 wks (average 15% reduction) compared to baseline

2 No Change

2 studies showed no measurable change

3 Increase

3 studies measured increase in diarrhea reported in last 2 wks (average 9% increase)




4 Qualitative indications

4 studies did not quantitatively measure diarrhea prevalence but indicated a reduction in qualitative results

**“Even when water is microbiologically safe, hundreds of millions of people face harassment, assault, injury, poisoning, anxiety, exhaustion, depression, social exclusion, discrimination, subjugation, hunger, debt, or absenteeism from work, school, or family care when retrieving or consuming household water.”**

**- Stoler et al, 2022, Measuring Transformative WASH**

# Measuring transformative WASH: A new paradigm for evaluating water, sanitation, and hygiene interventions

Justin Stoler<sup>1,2</sup>  | Danice B. Guzmán<sup>3,4</sup>  | Ellis A. Adams<sup>3,4,5</sup> 

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<sup>2</sup>Department of Public Health Sciences, Miller School of Medicine, Miami, Florida, USA

<sup>3</sup>Pulte Institute for Global Development, University of Notre Dame, South Bend, Indiana, USA

<sup>4</sup>Keough School of Global Affairs, University of Notre Dame, South Bend, Indiana, USA

## Abstract

Progress toward achieving Sustainable Development Goal 6, clean water and sanitation for all, is behind schedule and faces substantial financial challenges. Rigorous water, sanitation, and hygiene (WASH) interventions have underperformed, casting doubt on their efficacy and potentially undermining confidence in WASH funding and investments. But these interventions have leaned on a narrow set of WASH indicators—linear growth and diarrhea—that reflect a 20th-century prioritization of microbiological water quality as the most

# What is Transformative WASH?

Some are linking it with the need to achieve “Safely Managed” levels of WASH service, beyond Basic

Building large scale WASH Systems that enable behavior change

Measures are grounded in “access” to infrastructure-based services and interventions

The new JMP ladder for household drinking water services

Service level	Definition
<b>Safely managed</b>	Drinking water from an improved water source which is located on premises, available when needed and free of faecal and priority contamination
<b>Basic</b>	Drinking water from an improved source provided collection time is not more than 30 minutes for a roundtrip including queuing
<b>Limited</b>	Drinking water from an improved source where collection time exceeds over 30 minutes for a roundtrip to collect water, including queuing
<b>Unimproved</b>	Drinking water from an unprotected dug well or unprotected spring
<b>No service</b>	Drinking water collected directly from a river, dam, lake, pond, stream, canal or irrigation channel

# What is Transformative WASH?



THE SDG REPORT 2025



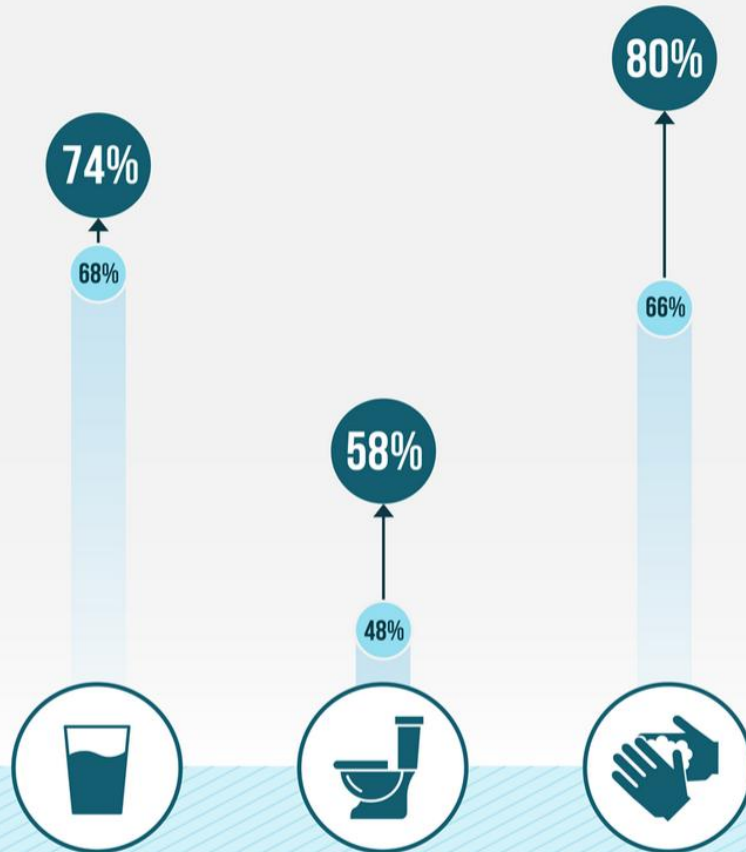
+

PROGRESS  
IN WASH  
SERVICES

+

+

(2015–2024)



**So what?  
How does “WASH  
Access” actually  
transform lives?**

**Focusing  
disproportionately on  
microbial impact of  
WASH projects misses a  
big part of all the ways  
WASH transforms lives**

# **What is Transformative WASH?**

**“Transformation should be considered as a level of ambition rather than a level of service, seen in terms of outcomes (and impacts) as opposed to outputs and interventions”**

**– Ian Ross, Asst. Professor WASH Economics, LSHTM**

# What is Transformative WASH?

**Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.**

—  
WHO Constitution

**Measures of WASH intervention success should incorporate all the impacts (physical, psychosocial, etc.) to reinforce the WASH value proposition**

**– Justin Stoler (Professor Global Development and Public Health, U Miami), et. al.**

## EXPERIENCE OF WATER INSECURITY



# Water Insecurity and Mental Health

**From Wutich, Brewis, and Tsai, Water and Mental Health, 2020**

# Considerations for new biosocial indicators supported by academic research

From Stoler et al,  
2022

**TABLE 1** Summary of select survey tools for measuring physical and biosocial outcomes of WASH interventions.

Domain	Measure
Water and sanitation insecurity experiences	Household Water Insecurity Experiences (HWISE) Scale (Young et al., 2019)—measures frequency of 12 water-related disruptions Sanitation Quality of Life (SanQoL; Ross et al., 2022)—measures frequency of five sanitation attributes
Mental health	Perceived Stress Scale (PSS-4; Cohen et al., 1983)—measures perceptions of psychological stress General Anxiety Disorder (GAD-7; Spitzer et al., 2006)—measures severity of anxiety Depression Anxiety Stress Scale (DASS-21; Henry & Crawford, 2005)—measures depression, anxiety, and tension/stress Patient Health Questionnaire depression scale (PHQ-9; Kroenke et al., 2001)—measures degree of depression severity
Gender roles	Empowerment in Water, Sanitation and Hygiene Index (Dickin et al., 2021)—measures women's empowerment and other gendered outcomes
Reproductive health	Menstrual Practice Needs Scale (MPNS-36; Hennegan et al., 2020) or other menstrual insecurity tools (Caruso et al., 2020)—measures the extent to which respondents' menstrual practices and environments meet women's needs
Violence	DHS module on domestic violence (Choudhary et al., 2020)—collects self-reported data on women's experiences of physical and emotional violence from family members Individual survey items about conflict (Pearson et al., 2021)—measure WASH-related conflict within the household, community, and potentially other scales
Injuries	Water-fetching injuries and symptoms module (Venkataramanan et al., 2020)—assigns multiple ICD-11 codes to injury or symptom, body location, mechanism/activity, and environmental context
Noncommunicable diseases	Assessments of maternal health, nutrition, and other leading noncommunicable diseases are regularly captured by population health household surveys and can be incorporated into WASH evaluations.
Climate resilience and migration	Standard questions on international migration (United Nations, 2018)—reasons for migration should be expanded to capture dimensions of environmental change



# WATER INSECURITY EXPERIENCES (WISE) SCALES

Search this site



- About the Scales
- Measure Water Insecurity
- Impact
- Get In Touch



## HWISE-RCN

Household Water Insecurity Experiences (HWISE) - Research Coordination Network (RCN)

Water Insecurity Experiences (WISE) Scales

## Cross-culturally validated tools to measure water access and use

- **12 Questions, 5 mins**
- **Asks respondents to reflect on experiences of water availability, accessibility, use, acceptability, and reliability throughout the prior four weeks.**
- **Considers the emotional toll that accompanies water insecurity, such as worry and shame.**



WORRY\*



INTERRUPT



CLOTHES



PLANS\*



FOOD



HANDS\*



BODY



DRINK\*



ANGRY



SLEEP



NONE

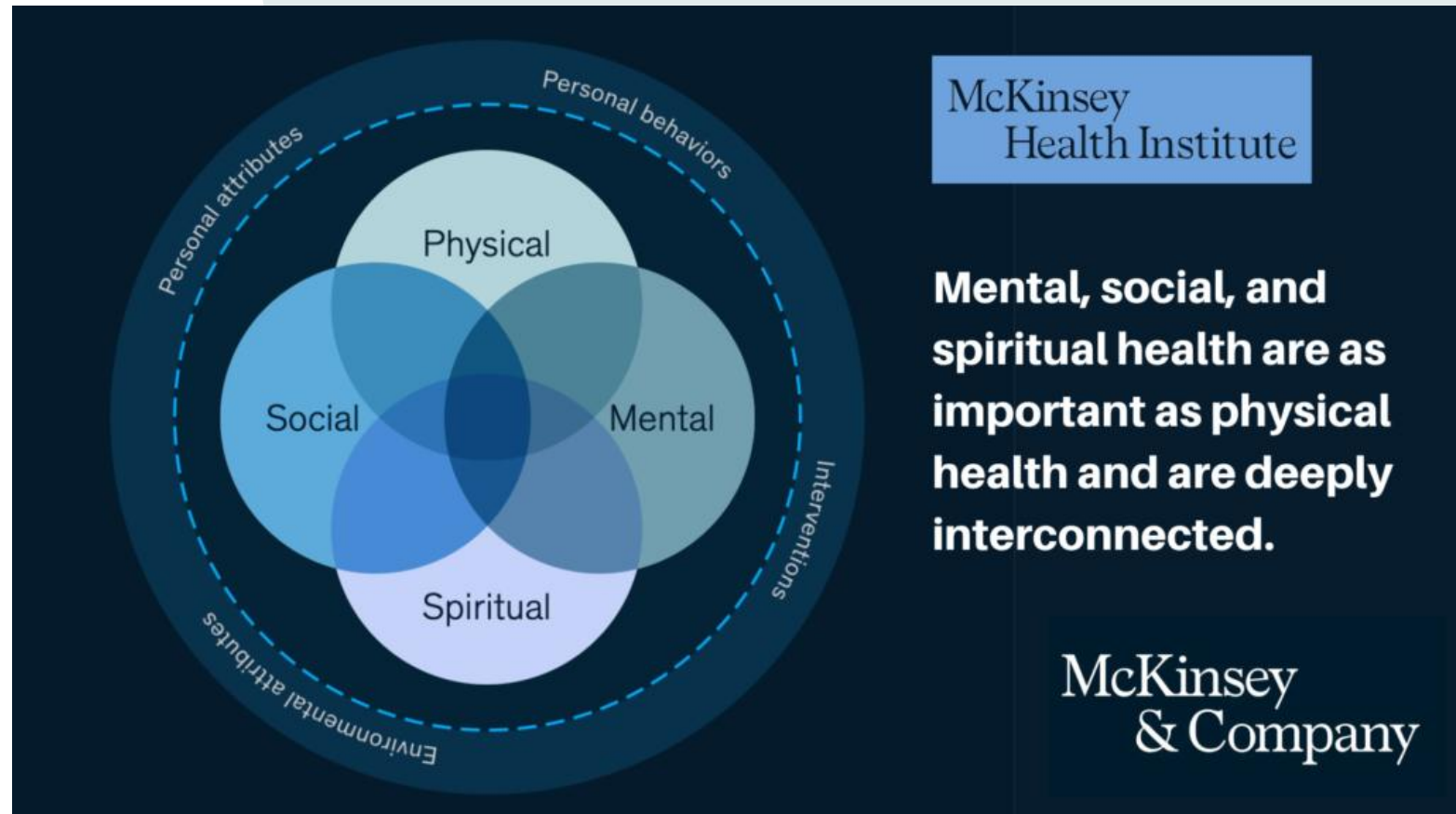


SHAME

# How do we discern the best outcome and impact metrics for our Christ-centered WASH programs?

The Christian perspective of transformation?

WHO definition of health excluded the spiritual domain.



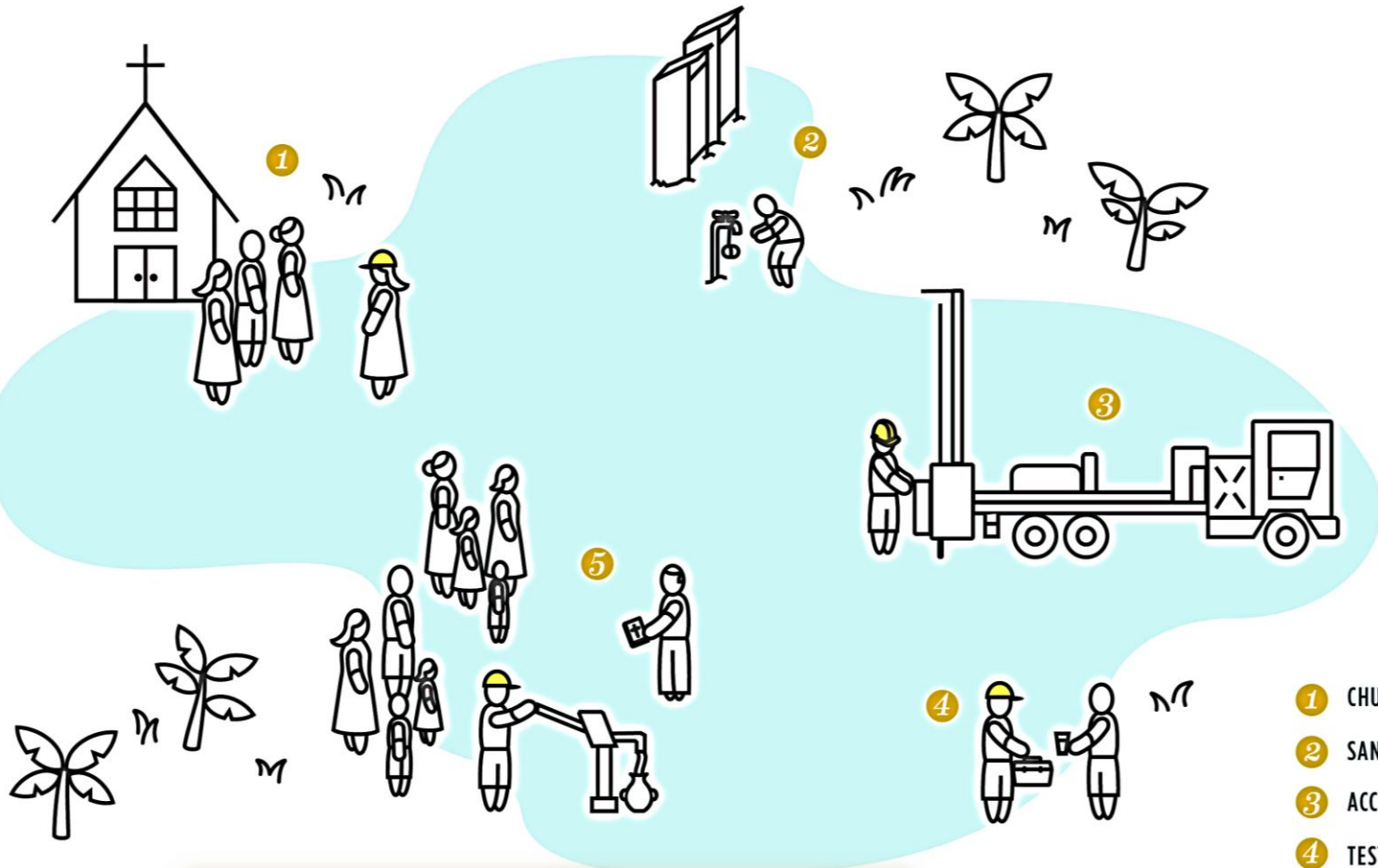


# What is Transformative WASH?

**Proposed LWI Definition:**

**The development of enabling environments that result in sustainable and holistic WASH “Systems” that contribute to the physical, mental, social, and spiritual flourishing of all.**

# Living Water Programmatic Approach



**WASH Program  
Area**

- 1 CHURCH + COMMUNITY MOBILIZATION
- 2 SANITATION AND HYGIENE PROMOTION
- 3 ACCESSING SAFE WATER
- 4 TESTING WATER QUALITY
- 5 DEMONSTRATING GOD'S LOVE



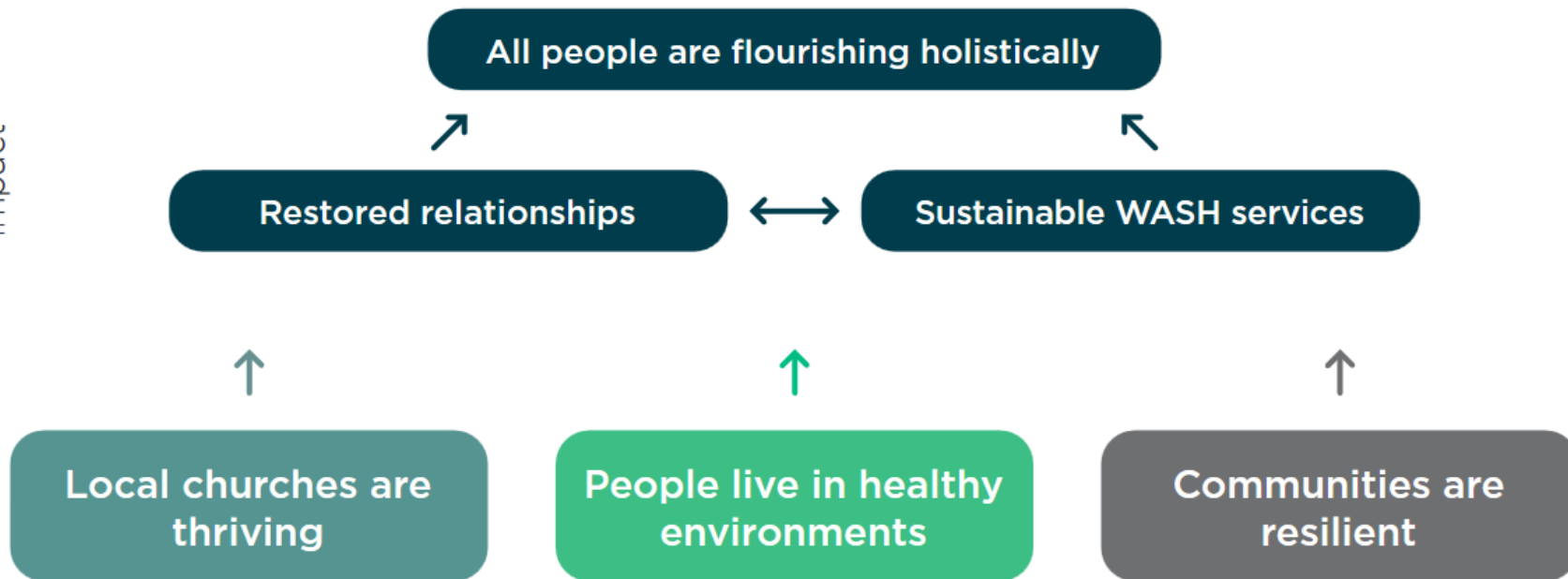
**FLOURISH**

Mobilizing Churches & Communities for  
WASH-Focused Transformation

# Theory of Change

Visualized

Impact



**Holistic Flourishing:**  
Physical,  
Spiritual, and  
Social  
wellbeing

Impact

**Violence**

**Gender Roles/  
Empowerment**

All people are flourishing holistically

**Flourishing  
Metrics**

**Mental  
Health**

Restored relationships

Sustainable WASH services

**HWISE**

**Local churches are thriving**

As they live out their integral mission in the world, effectively demonstrating and proclaiming the gospel in their communities, local churches are thriving. Living Water continues to walk alongside churches throughout the process, also equipping them with new resources and tools for gospel proclamation, including a relational approach called "Bible storying." As churches help more people in their communities come into right relationship with God, this also helps restore relationships with others in the community and the environment. This increased sense of solidarity contributes to the other outcomes.

**People live in healthy environments**

Through these mutually enforcing outcomes of improved WASH behaviors and services, more people live in healthy environments. A healthier natural environment is one in which people are less likely to contract a WASH-related disease; it also means a better social environment that values WASH for all. Partners, such as guardian churches, and other local stakeholders, sustain these improvements through active monitoring and maintenance.

**Communities are resilient**

Thriving churches and coordinated partners can help achieve the outcome that communities are resilient. A community is resilient when there is trust, shared concern, and love for others to organize for collective action, intervening on behalf of the common good (particularly for the most vulnerable).

**Social  
Cohesion and  
Social Capital**

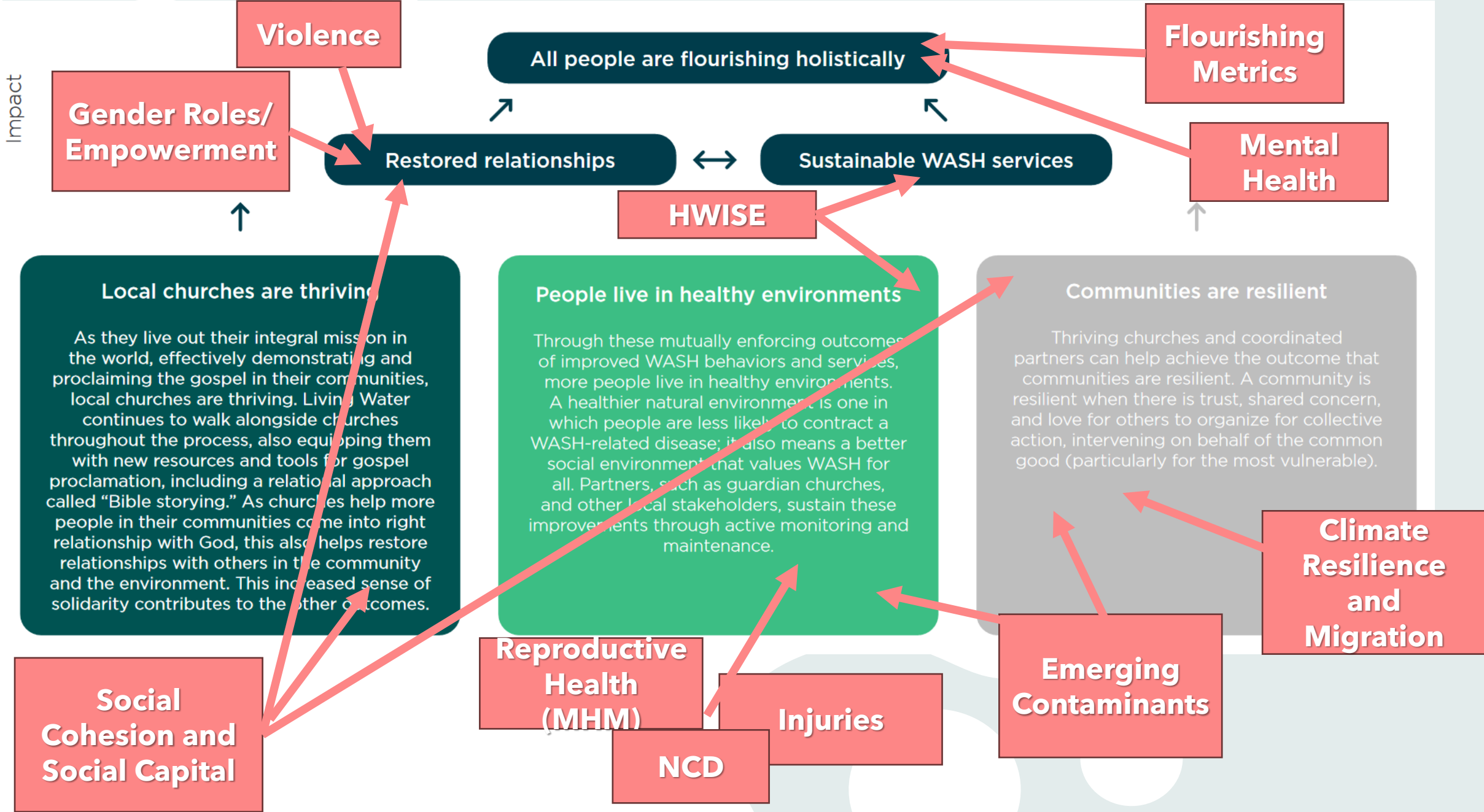
**Reproductive  
Health  
(MHM)**

**NCD**

**Injuries**

**Emerging  
Contaminants**

**Climate  
Resilience  
and  
Migration**



# Metric Usage, Development, and Considerations

## Considerations

ToC and Program  
Outcome  
Considerations

How much  
influence can a  
WASH org have?

Capacity to  
intervene

Cultural  
Appropriateness  
and Translation of  
Ideas

Length  
Burden/Number  
of Questions

Utilize  
standardized  
questions as  
much as possible

**Just because you can measure it,  
doesn't mean you should**

**Mental Health:** Cultural understanding and stigma

**Domestic Violence:** Limited ability to intervene

**Non-WASH related diseases:** Limited ability to intervene

**Purpose and Meaning:** Some questions too "western" in thought; did not translate across all cultures

**Participation, Influence, Empowerment:** Must be cautious to not be "political"

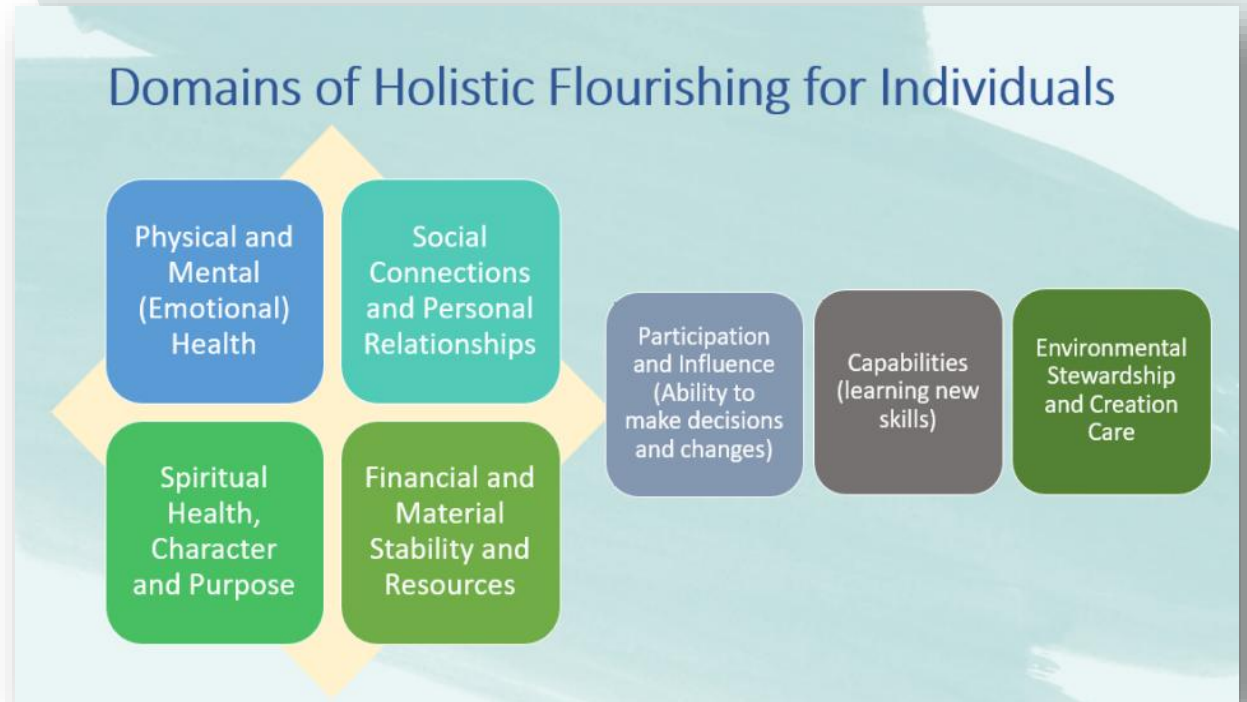
**Living Faith:** Concerns about safety and laws in Christian-minority contexts or NGO work

**Ease of Translation:** Some rephrasing to ease translation

# Holistic Flourishing Framework: Communal and Individual Flourishing




Adapted Light Wheel from Tearfund  
(With Churches and Communities)  
Qualitative/Quasi-Quantitative




Literature Review supported by the KIF Spiritual Metrics  
Library  
Harvard, Tearfund, Kingdom Impact Framework, PERMA,  
McKinsey, etc.


Quantitative for household surveys


# HF Tool Domains : Blending Literature Domains and LWI Focus

 <b>Physical Wellbeing</b>		
		On a scale of 0 to 5, in general, how would you say your health is? (0 = terrible, 5 = excellent)
Physical Health	1	
Physical Health	2	People in my household are frequently ill (reverse score)
Emotional/Mental Health	3	I am optimistic /hopeful (or I have hope) for a better future for me and the future of those living in my household
Emotional/Mental Health	6	In stressful situations, I really struggle to manage my emotions (reverse score)

 <b>Spiritual Wellbeing</b>		
Character and Virtue	4	I actively contribute to the happiness and well-being of others
Spiritual Health	5	Being part of a local faith community is important to me
Spiritual Health	7	My spirituality helps me have a better relationship with others
Spiritual Health	8	I do things to grow spiritually
Character and Virtue	11	I do things to help make my community a better place
Meaning and Purpose	15	Most of the time I feel a sense of achievement from what I do

<b>Spiritual Wellbeing (Extended)</b>	
19	I have made a personal commitment to Jesus Christ that is still important in my life today
20	I pray with other people
21	I help other people grow closer to God

 <b>Social Wellbeing</b>		
Close Relationships	9	There are people in my life who give me support and encouragement
Social Connectedness	10	I feel a sense of belonging in my community
Participation and Influence	12	I believe that people like myself can change things in this community if we come together to work toward it
Social Connectedness	13	My community is a good place to live

 <b>Sustainability</b>		
Financial/Material Stability	14	I often worry about being able to meet everyday needs like food, safety, housing, or other necessary expenses (reverse score)
Capabilities	16	Over the course of the last year, I have learnt a new skill that has improved the quality of life for me or my family
Stewardship	17	I believe that my children (or the next generation) will have access to sufficient natural resources such as water, land, pasture, woods or forests to meet their needs when they grow up
Stewardship	18	I feel prepared to handle a crisis in my life or community

**6-point Likert-type Scale: 18 Questions (21 extended), Point Range 0-5**

**From Completely disagree to Completely Agree (Q1 exception)**

**Scoring Range: 0-90 (or 105 with extended spiritual questions), and sub-domain scores**

**Three  
Countries**

**Honduras  
Kenya  
India**

**29  
Communities**

**15 Intervention  
14 Control**

**154 Surveys**

**78 Intervention  
76 Control**

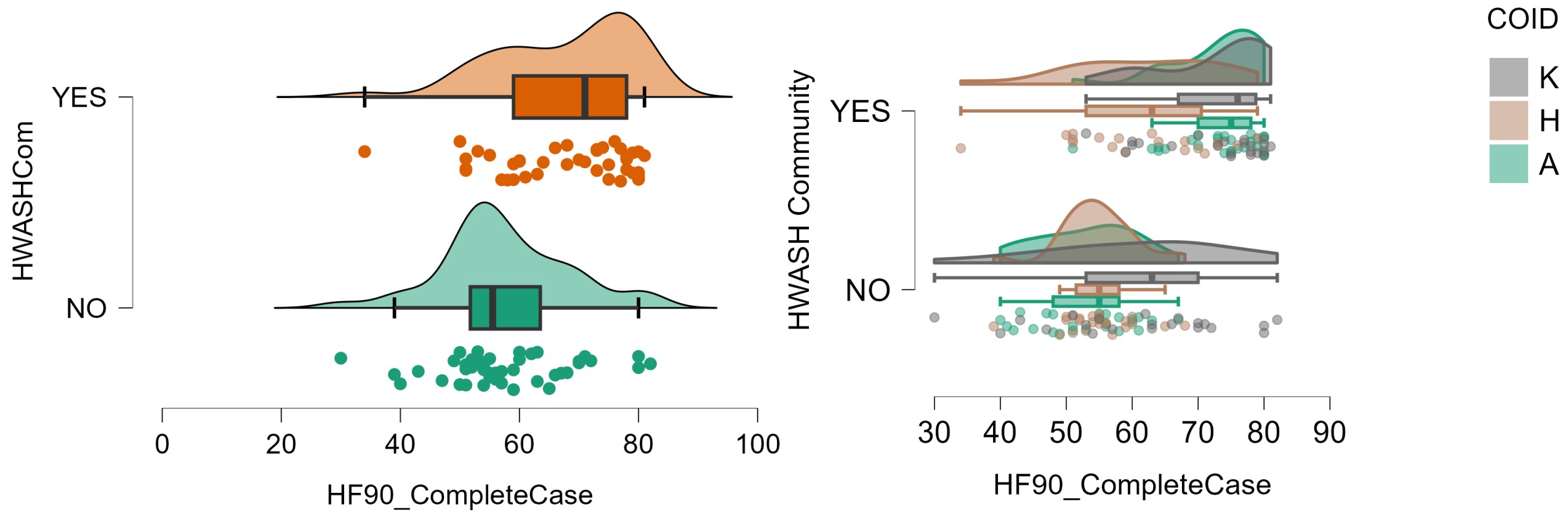
**WASH Access**

**Demographics**

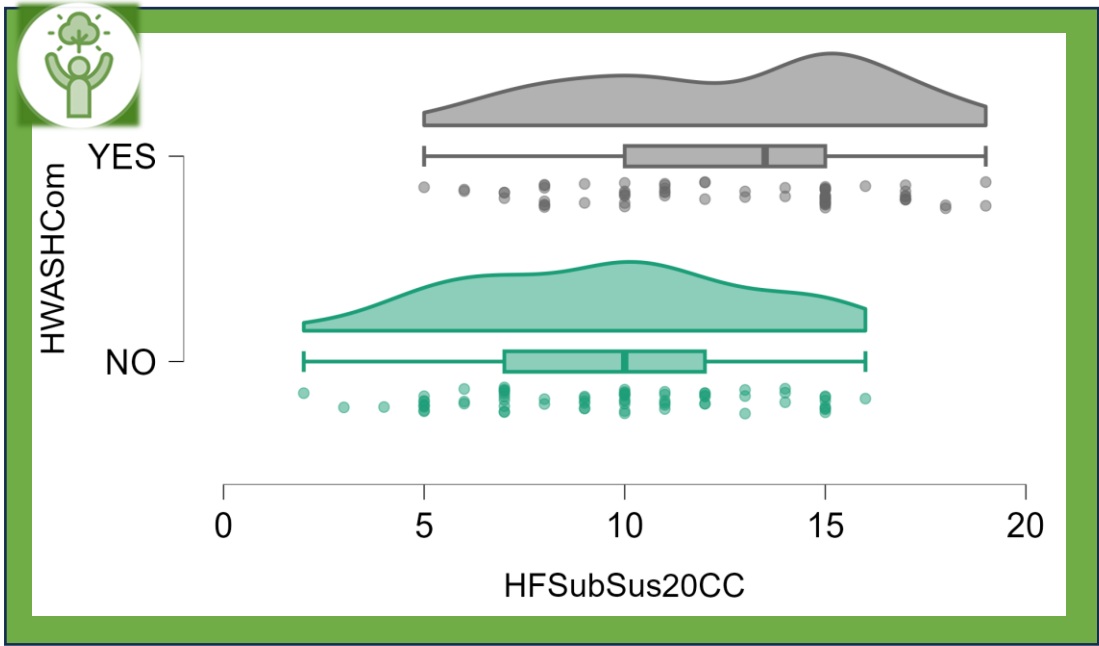
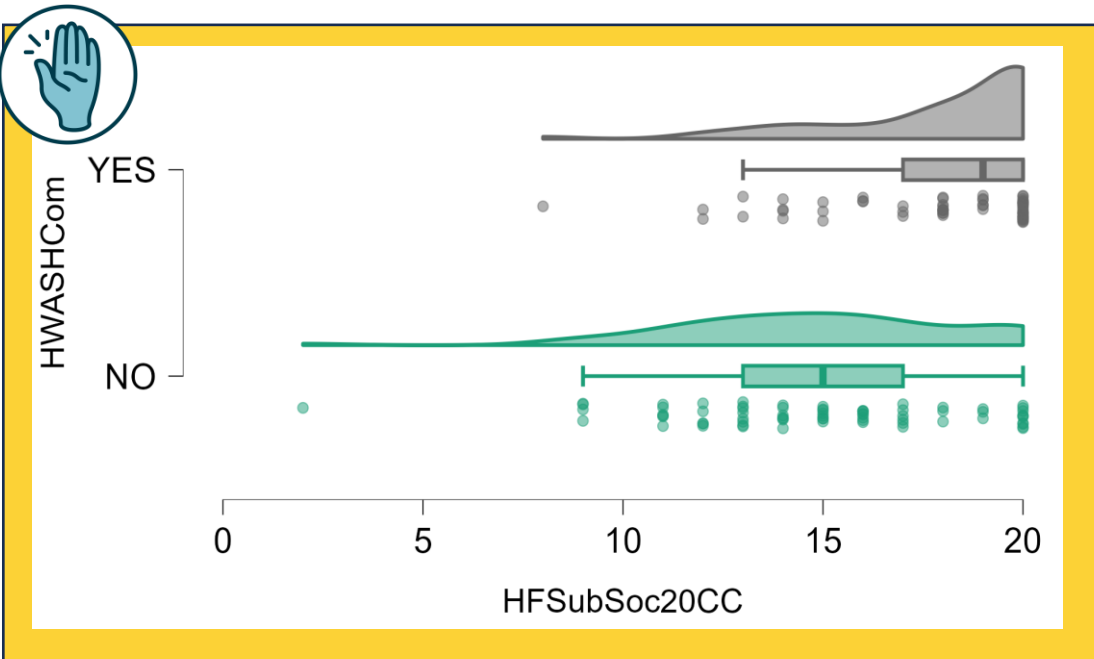
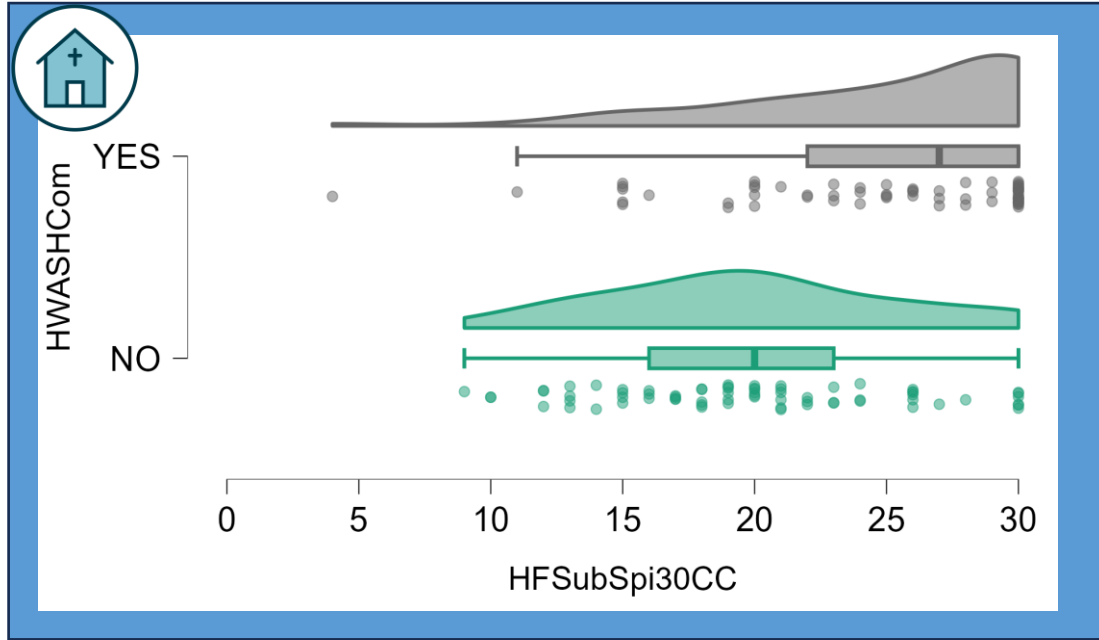
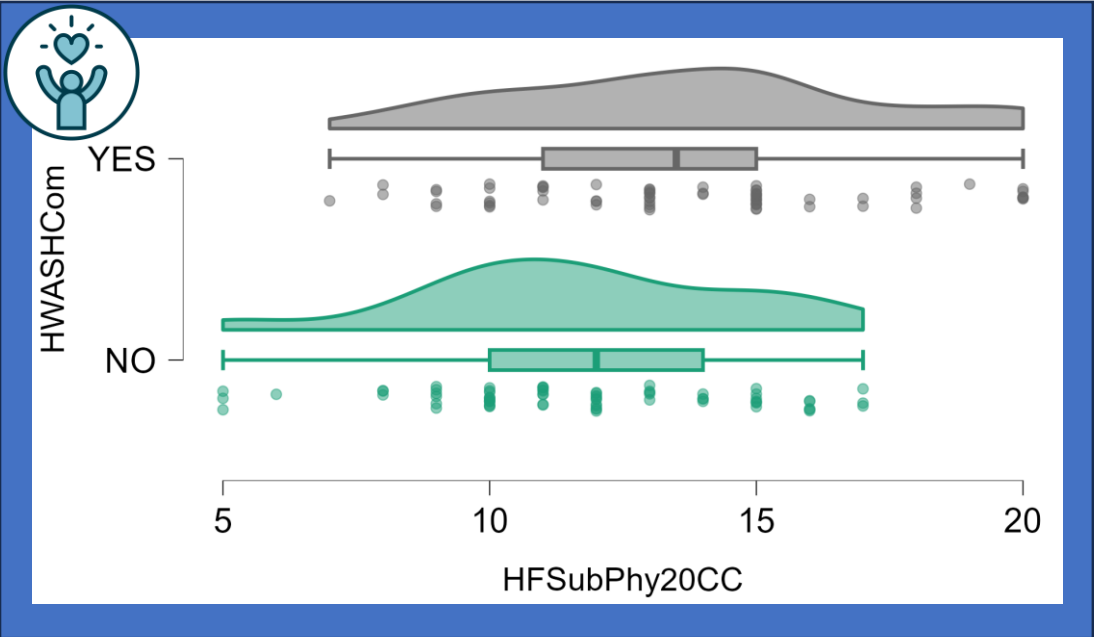
# Results

Holistic Flourishing Scores by Community Type								
		95% Confidence Interval Mean						
		N	Missing	Mean	Lower	Upper	Minimum	Maximum
HF90_CC	NO	69	7	<b>55.94</b>	53.57	58.31	30.00	82.00
HF90_CC	YES	66	12	<b>69.50</b>	67.00	72.00	34.00	81.00
HF105_CC	NO	44	32	<b>69.45</b>	65.53	73.38	41.00	97.00
HF105_CC	YES	41	37	<b>80.27</b>	75.76	84.77	41.00	96.00

# Results



**12-15% higher mean Holistic Flourishing Scores in Communities where LWI has worked**



# Continuing the Conversation

As a WASH organization, how have you approach measuring changes in the whole health of an individual who participates in your program?

As a Public Health organization - knowing that WASH impacts more than "just diarrhea" but the Physical, Mental, Social, and Spiritual well-being - how does this affect the way you think about your own program-related outcomes? Do you regularly capture WASH indicators?

# Final Thoughts

Breaking down silos in our thinking of “health”

Collaborating cross-sectorally (Yay for our public health colleagues)

Christ-centered gives us an additional “advantage” to leaning into Transformative WASH

Our spiritual formation work, integral mission, and kingdom mindset is not separate from, but an essential component of Transformative WASH.



**Thank You**

[aelliott@water.cc](mailto:aelliott@water.cc)



# Resources for Further Reading:

<https://wires.onlinelibrary.wiley.com/doi/10.1002/wat2.1674>

[https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(23\)00013-X/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(23)00013-X/fulltext)

[https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(23\)00028-1/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(23)00028-1/fulltext)

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<https://washeconomics.com/2019/10/04/lets-not-misinterpret-wash-b-and-shine-results-as-wash-doesnt-work/>

<https://programme.worldwaterweek.org/Content/ProposalResources/PDF/2018/pdf-2018-8062-4-Prendergast%20180829%20Stockholm%20Water%20Week.pdf>

<https://pubmed.ncbi.nlm.nih.gov/33835026/>

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0286146>

<https://wires.onlinelibrary.wiley.com/doi/10.1002/wat2.1666>

<https://wires.onlinelibrary.wiley.com/doi/abs/10.1002/wat2.1461>

<https://pubmed.ncbi.nlm.nih.gov/35780792/>