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Understanding Behaviour and Behaviour Change



BushProof



What is behaviour?

Behaviour is about what we **do**.

- It is not what you know
- It is not what you believe
- Its not what you say you do
- It is not what buildings or things are in place
- It is not about your skills
- It is not about your intentions

Behaviour change occurs when someone is faced with a familiar situation but does something new or different.

Behaviors: Handwashing



Behaviors: Handwashing



Behaviors: Handwashing



Behaviors: Handwashing

BEFORE

Feeding

Eating

Cooking

AFTER

Defecating

Coughing / sneezing

Cleaning child

Behaviors: Handwashing

Handwashing as a behavior is quite complex

- Requires a number of tools / technologies
- Requires sufficient time

Handwashing is sequence dependent

- What has happened immediately before?
- What is happening next?

Handwashing can be context dependent

- Home
- School
- Clinic

Behaviors: Sanitation



Behaviors: Sanitation

Buy / build

Use

Maintain



Behaviors: Sanitation

Buy / build

Use

Maintain



Changing Handwashing Behavior

Efforts to improve handwashing behaviors too often focus on

How to wash hands

When to wash hands

Why wash hands

Changing Handwashing Behavior

Efforts to improve handwashing behaviors too often focus on:

How to wash hands = FOLLOW THESE STEPS

When to wash hands = AT KEY TIME

Why wash hands = AND AVOID GETTING SICK



GLOBAL HANDWASHING DAY

OCTOBER 15

ALWAYS WASH YOUR HANDS!



1

**BEFORE
HANDLING FOOD**



2

**AFTER USING
THE TOILET**



A

WET
Just enough
water to cover
your hands



B

LATHER
For 20
seconds



C

RINSE
With running
water

**CLEAN HANDS
SAVE LIVES!**

Stop Germs, Stay Healthy!



Use soap



Wash hands often
(for 20 seconds)



Rinse well



Dry with
a towel



Elimine gérmenes, manténgase saludable

- Lávese las manos frecuentemente por 20 segundos
- Cubra su boca al toser
- Quédese en casa cuando se sienta enfermo

Harris County
HCPHES
Public Health & Environmental Services
www.harriscountyhealth.com

Available in alternate formats

CLEAN  **N**
Hands
save lives



**A FISTFUL
OF SOAP**



**CLEAN UP YOUR ACT...
DISEASE IS A FACT!**

**WANT TO KNOW MORE?
- ASK HERE!**

Changing Handwashing Behavior

Efforts to improve handwashing behaviors too often focus on

How to wash hands = FOLLOW THESE STEPS

When to wash hands = AT KEY TIME

Why wash hands = AND AVOID GETTING SICK

Focus here is on knowledge

Assumption that if people know more and understand risks, they will change behaviors

The Role of Theory

As we discuss behaviors and behavior change, we often make reference to THEORY

Do not think of this in overly abstract terms.

National Cancer Institute, [Theory at a Glance](#):

A theory presents a systematic way of understanding events or situations... [it] provides a road map for studying problems, developing appropriate interventions, and evaluating their successes.

Changing Knowledge: The Health Belief Model

“Two major factors influence the likelihood that a person will adopt a recommended preventive health action. First they must feel personally threatened by the disease i.e. they must feel personally **susceptible to a disease with serious or severe consequences** Second they must believe that the **benefits**

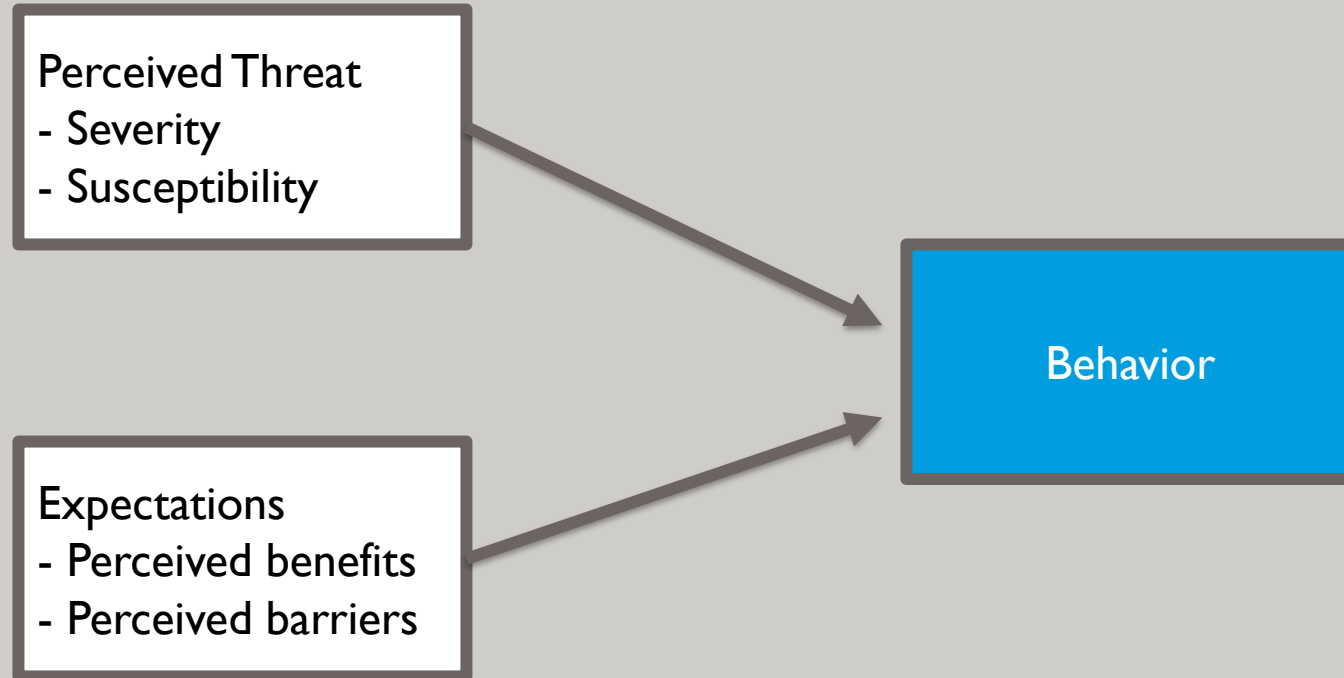
- Developed in 1950s - one of the first theories of health behavior
- Based on research related to TB screening in the US
- In public health, remains widely used (often implicit basis)

Source: Fishbein summarising Becker [1974, 1984], Janz and Becker [1984], Rosenstock, Strecher and Becker [1994] page 3 in Developing Effective Behavior Change Interventions, Fishbein M, Univ Of Illinois

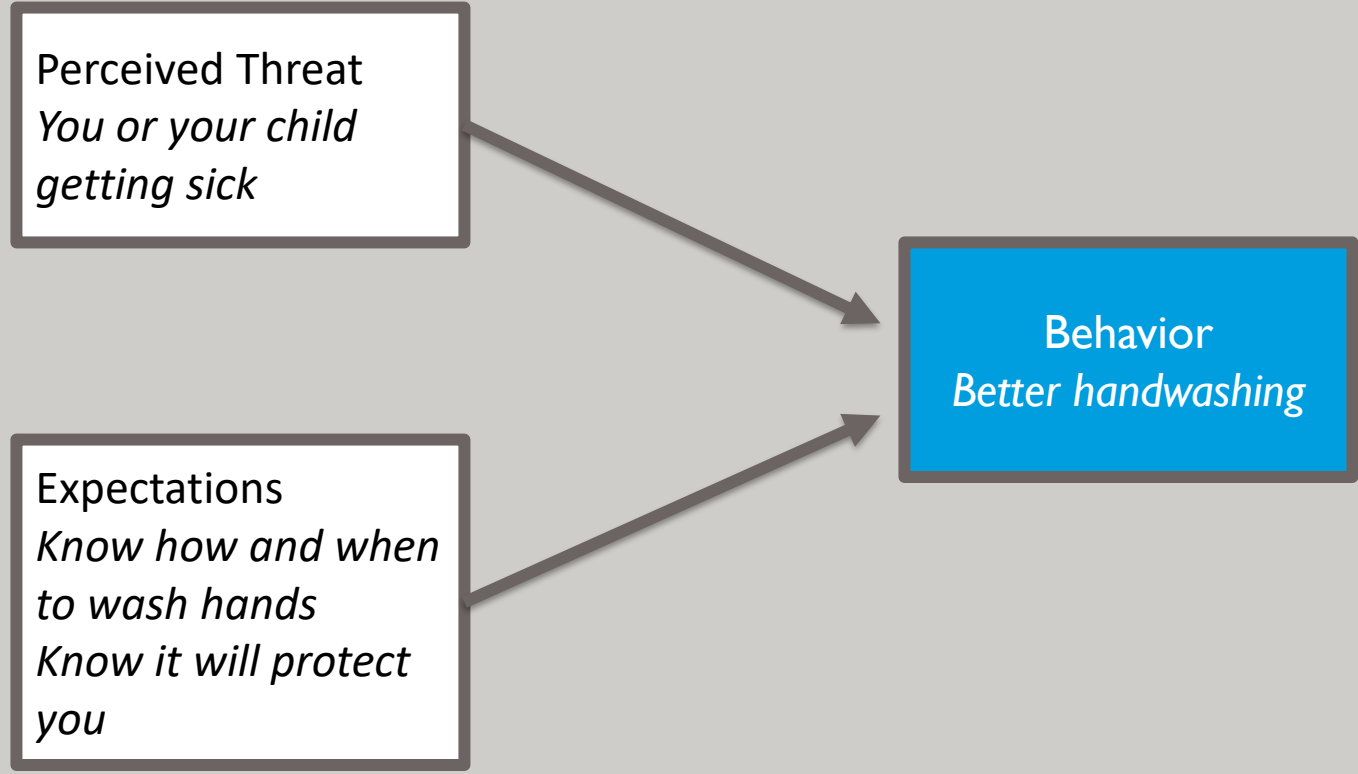
action outweigh the perceived barriers to

(and/or costs of) preventive

Changing Knowledge: The Health Belief Model (simplified)



Changing Knowledge: The Health Belief Model (simplified)








Changing WASH Behaviours

A systematic review of hygiene and sanitation interventions

Intervention	Uptake	Adherence	Sustainability
Information and Education	Mixed evidence	Likely Ineffective	Likely Ineffective
Community-based approaches	Possibly effective	Effective	Mixed evidence
Social / Commercial Marketing	Insufficient data	Effective	Insufficient data
Psychological and social theory	Possibly effective	Possibly effective	Insufficient data

adapted from De Bruck et al. 2017

	Likely Ineffective
	Mixed evidence
	Possibly effective
	Effective
	Insufficient data

Limitations to the Health Belief Model

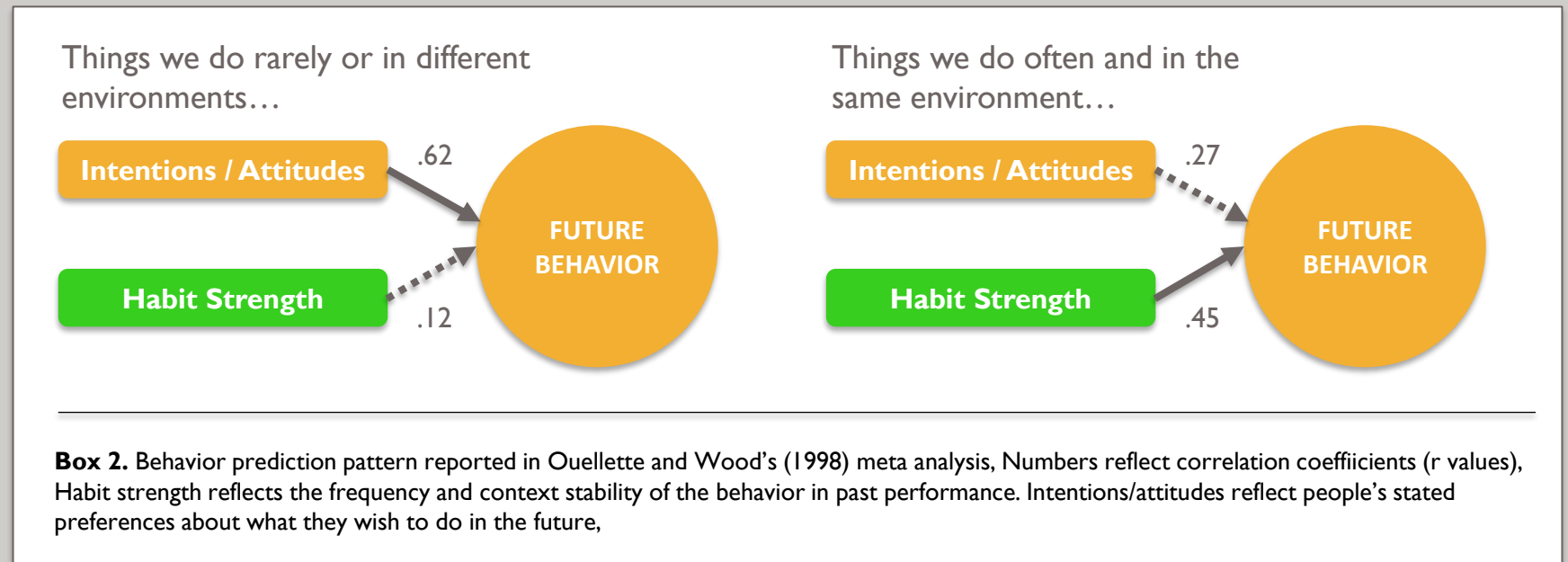
- Assumes that behavior is routed in what people **know** and **think** about a specific behavior.
- Misses many of the possible factors that can shape behaviors
- Will refer to these individual or constellation of factors that shape behaviors as **behavioral determinants**

How much of our own behavior do we really control?

Recent advances in cognitive science suggest that much of our behavior is automatic, not part of our conscious control.

- Unconscious reactions to specific stimuli
- Automatic, default behaviors

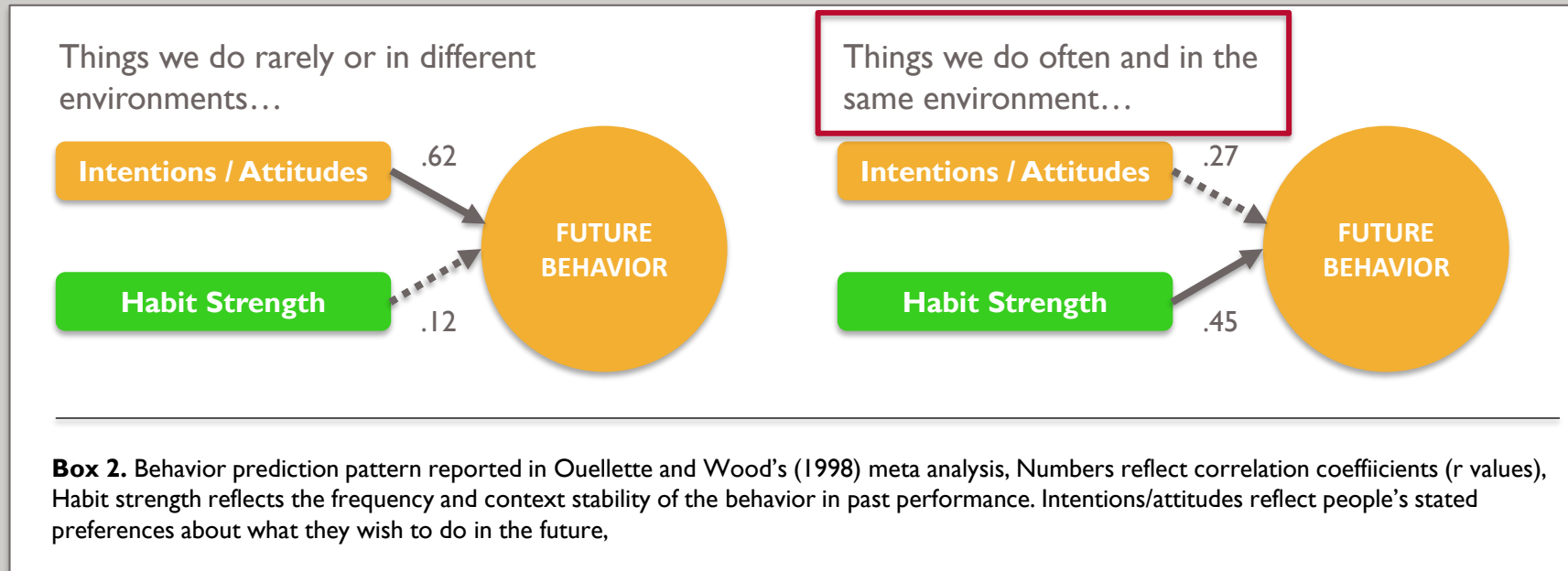
Some estimate that **80-90%** of the decisions we make **are automatic** habits formed through repeated behaviors in stable context.



How much of our own behavior do we really control?

”Things we do often and in the same environment”

Sounds a lot like handwashing!!!



Ouelette and Wood (1998) in: Neal et al., 2016

A look inside our brains



Vs.



Behaviour Settings

All behaviour is situated within a specific physical and social space – **a behavioural setting**

Behaviour is determined by:

- Standing pattern of behaviour within that setting
- infrastructure and props
- the roles and identities of the participants
- functions of individuals and objects within that space



Behaviour Settings

If behavior is a function of a specific setting, how can we change behaviours?

We can disrupt the setting!!!

How can we disrupt settings to change WASH behaviours?

Competencies	Traditional focus of knowledge, education
Props	Traditional focus of distribution, market-based approaches
Stage	Under-explored intervention options
Infrastructure	
Role	
Routine	
Norms	
Objectives	

How can we disrupt settings to change WASH behaviours?

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Disrupting Settings: Examples

1. Complex intervention utilizing several strategies to improve infant food hygiene in Nepal
2. Simple, focused intervention to improve handwashing with soap among school-aged children in Bangladesh

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Trial of a Novel Intervention to Improve Multiple Food Hygiene Behaviors in Nepal

Om Prasad Gautam,^{1*} Wolf-Peter Schmidt,¹ Sandy Cairncross,¹ Sue Cavill,² and Valerie Curtis¹

¹London School of Hygiene and Tropical Medicine, London, United Kingdom; ²Freelance Consultant, London, United Kingdom

Abstract. In this study, we report on the results of a trial of an intervention to improve five food hygiene behaviors among mothers of young children in rural Nepal. This novel intervention targeted five behaviors; cleanliness of serving utensils, handwashing with soap before feeding, proper storage of cooked food, and thorough reheating and water treatment. Based on formative research and a creative process using the Behavior-Centered Design approach,



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*Environmental Research
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Article

Behavior Change without Behavior Change Communication: Nudging Handwashing among Primary School Students in Bangladesh

Robert Dreibelbis ^{1,*}, Anne Kroeger ¹, Kamal Hossain ², Mohini Venkatesh ³ and Pavani K. Ram ⁴

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Tropical Medicine and International Health

doi:10.1111/tmi.12999

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Comparing the behavioural impact of a nudge-based handwashing intervention to high-intensity hygiene education: a cluster-randomised trial in rural Bangladesh

Elise Grover¹, Mohammed Kamal Hossain², Saker Uddin², Mohini Venkatesh³, Pavani K. Ram⁴ and Robert Dreibelbis^{1,5}

Nepal: Infant weaning foods

Multiple studies have documented high rates of contamination of infant foods with enteric pathogens

In many low- and middle-income countries, problems compounded by:

- Warmer ambient temperatures
- Lack of refrigeration and electricity
- Cooking and storage routines
- Environmental contamination

Plausible impact on diarrhoea, under-nutrition, and stunting.

5 Targeted Food Hygiene Behaviours

1. Cleaning children's plates and utensils
2. Washing hands with soap
3. Proper storage of food
4. Thorough reheating of leftover / stored food
5. Water and milk treatment

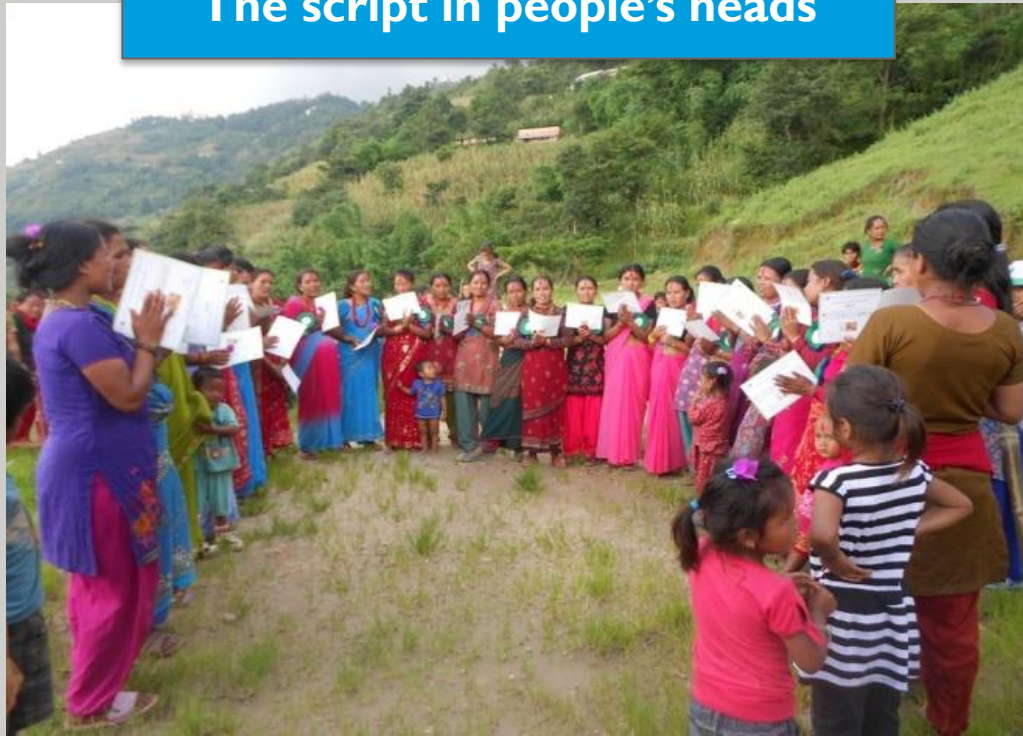


Changing kitchen setting to improve infant food hygiene

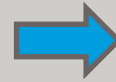


Script, Competencies, and Routines

The script in people's heads



Gautam, O., 2015



- **Community gathering**
- **Motivated people using nurture, disgust, status related activities**
- **Introduced new kitchen settings**
- **Introduced key behaviours**
- **New rules in for new setting**
- **Public commitments**

Infrastructure and Props



Gautam, O., 2015

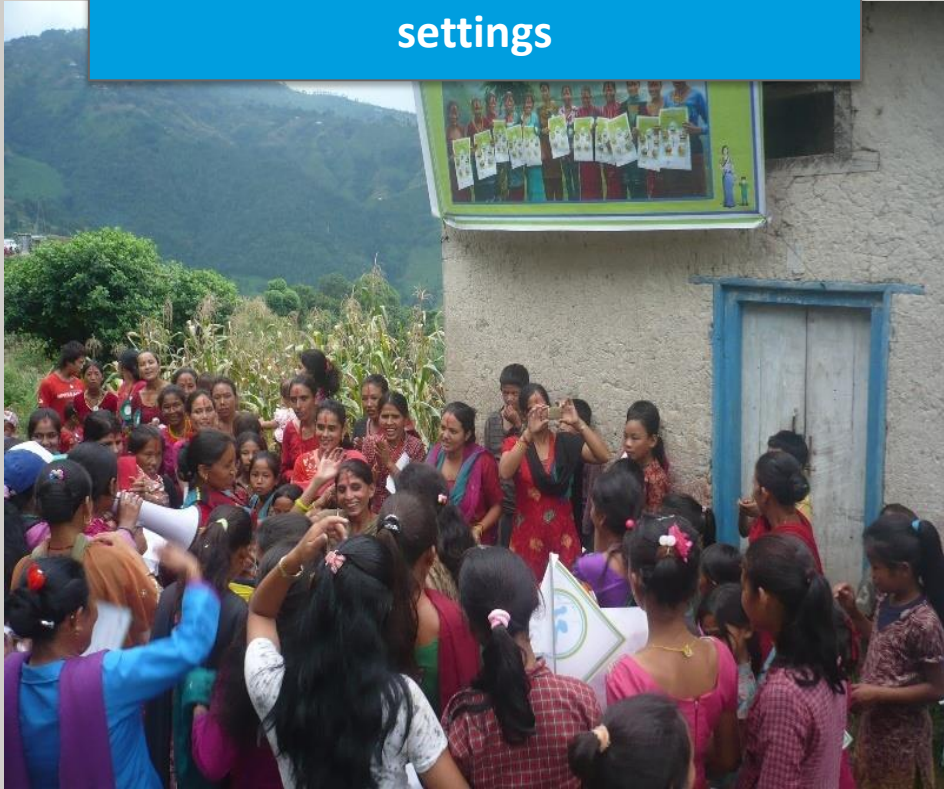


Kitchen makeover

- Kitchen demarcation using bunting
- Eye dangles placement
- Hand-washing station
- Declare 'safe hygiene zone'

Norms and Roles

Social norms belonging to that settings

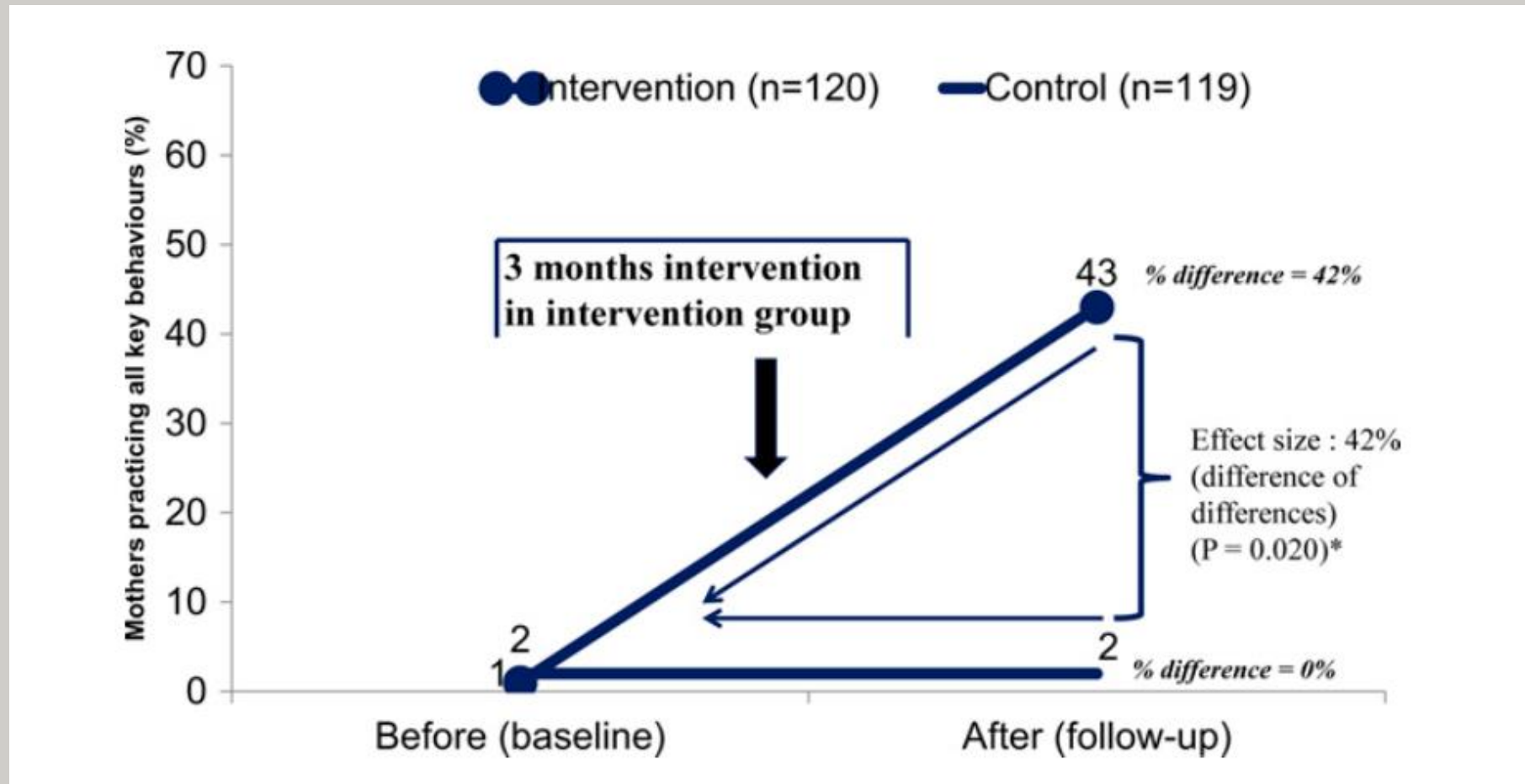


Gautam, O., 2015



- Desire to win clean kitchen and ideal mother competition
- Inspiration to be an ideal mother
- Ideal mother photos put-up in village junctions

Observed behaviours



Nudging Handwashing: Disrupting settings to improve HWWS among primary school-aged children

Nudges popularized in behavioural economics.

Interventions do not change:

- knowledge
- incentives
- decision making process

Alter the context (*environment*) in which behaviour occurs.



Feasibility Study: Testing nudge-based handwashing intervention in schools

Identified two schools in rural Bangladesh

Two stage intervention:

- Improved handwashing infrastructure
- Added nudges to new facilities

Structured observation of handwashing with soap (HWWWS) following latrine use



Feasibility Study: Testing nudge-based handwashing intervention in schools

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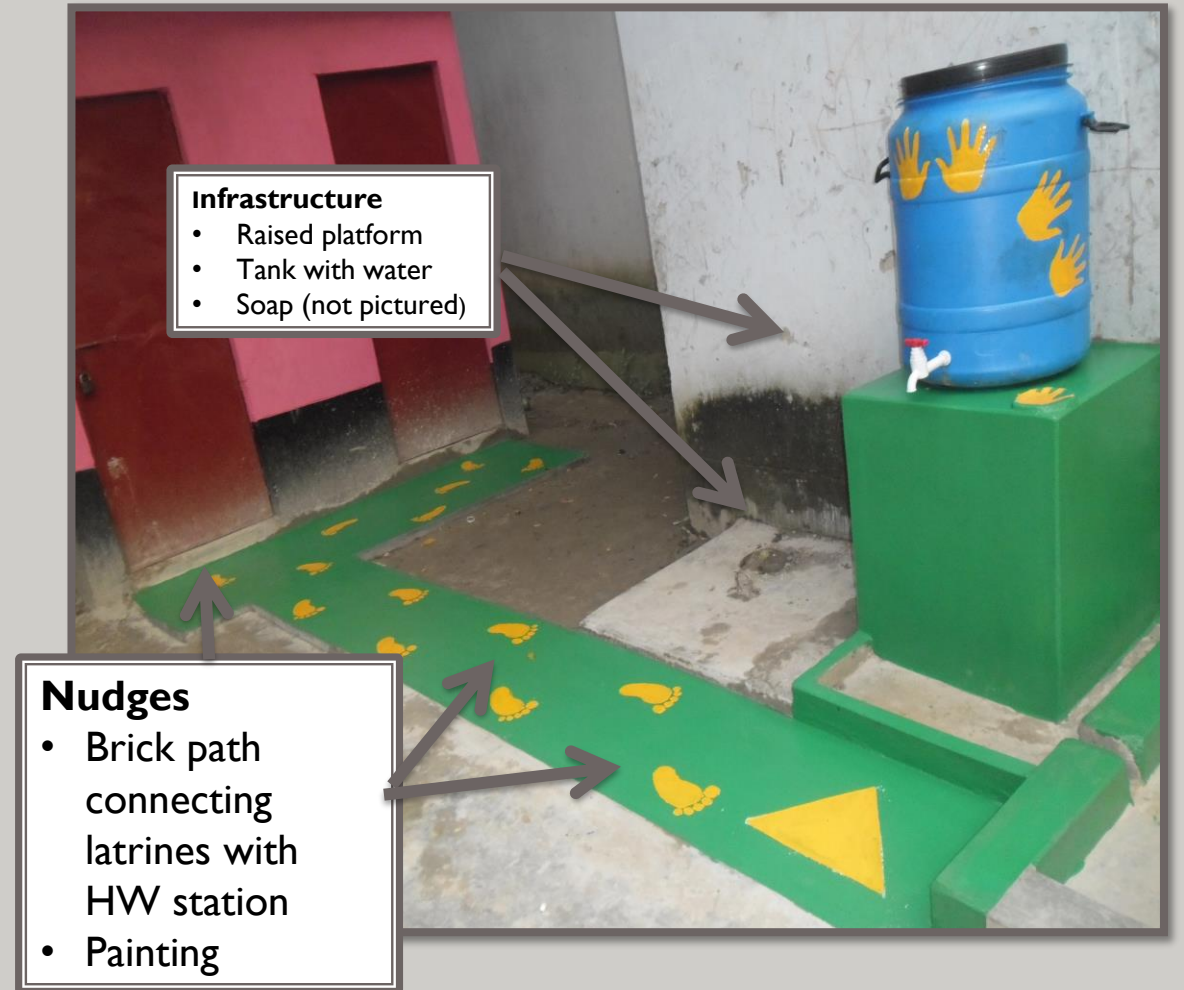
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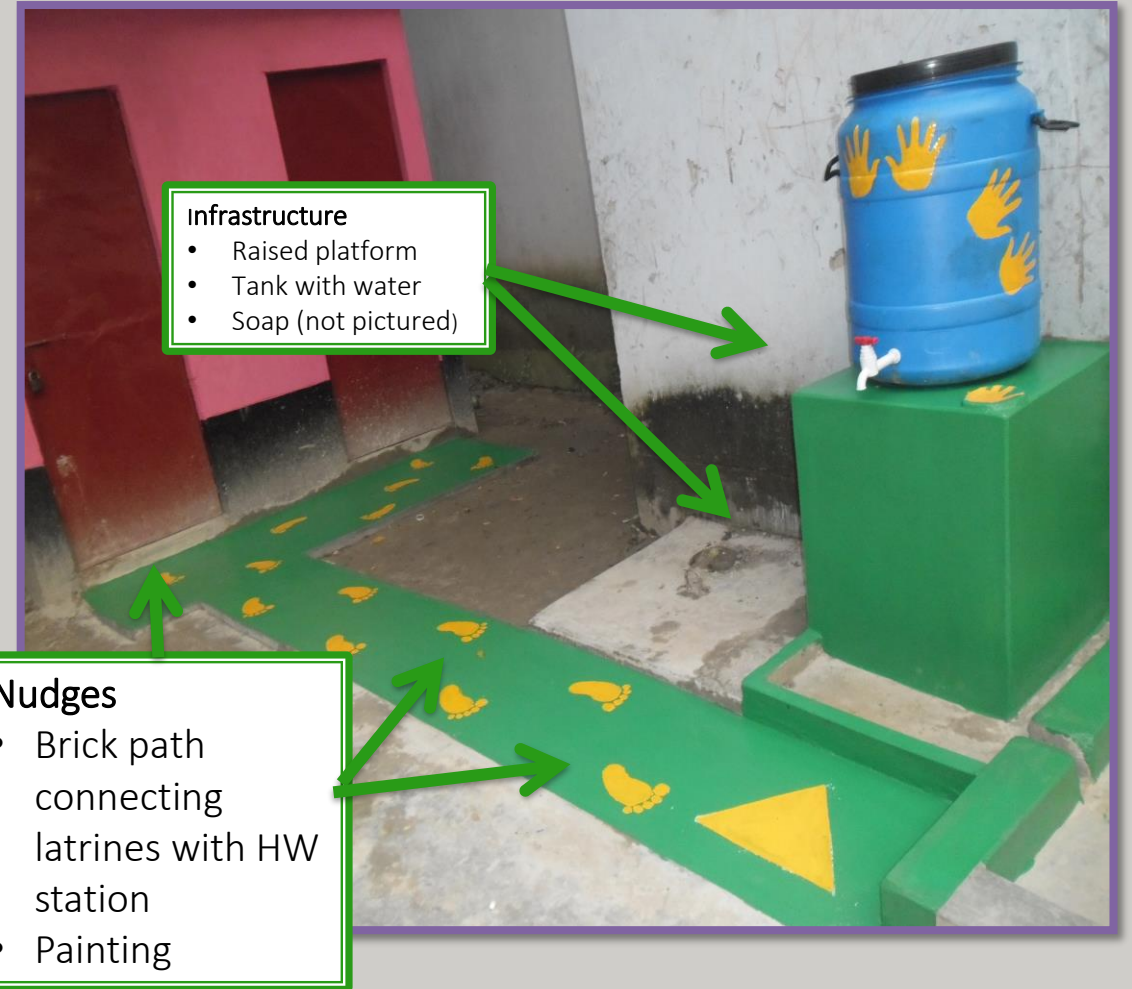
Two stage intervention:

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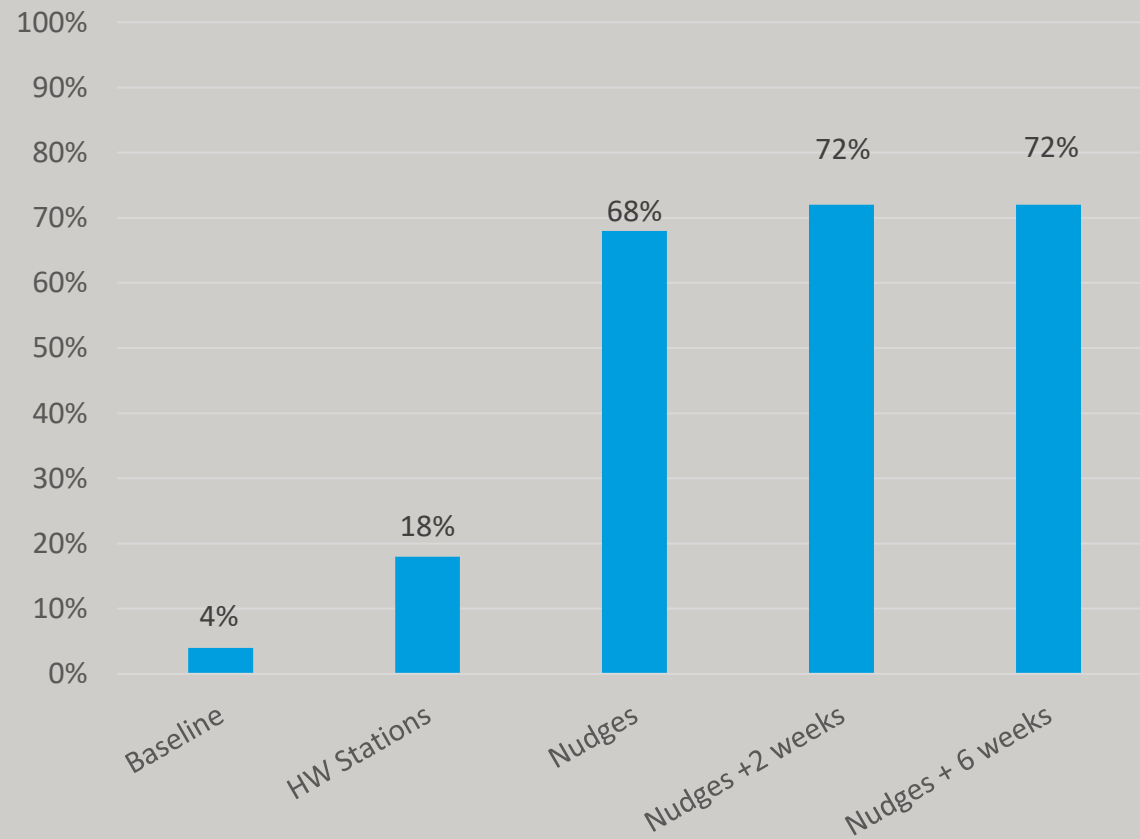
In Behaviour Settings terms:

Created a stage for HWWS with defined infrastructure and props



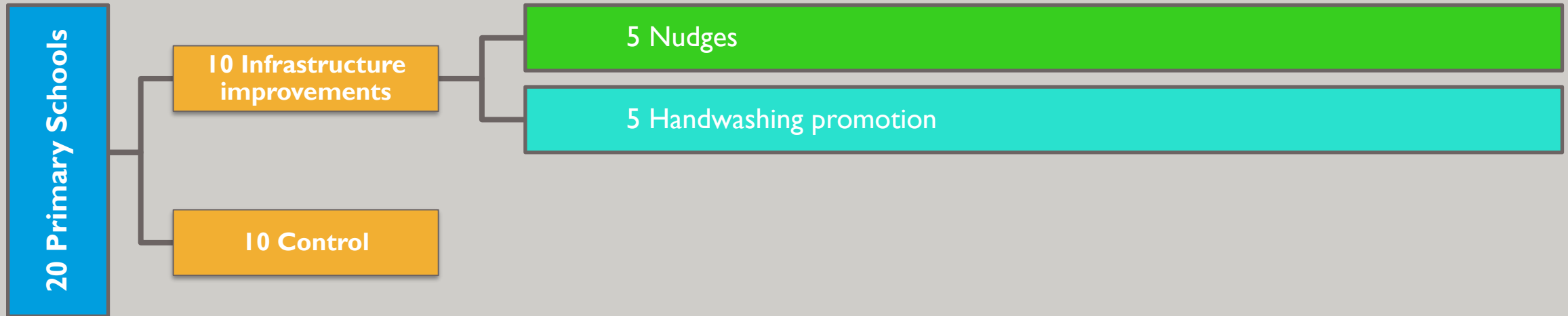
Feasibility Study Results: Observing changes in HWWS behaviors

Percentage of children washing both hands with soap after exiting school latrine (n = 921)



- At baseline, HWWS was minimal
- Minor improvements after improving *infrastructure*
- Largest jumps after introduction of nudges
- Improvements sustained for 6-week period

Nudging Handwashing Trial: Study design, interventions, and data collection



Nudges:

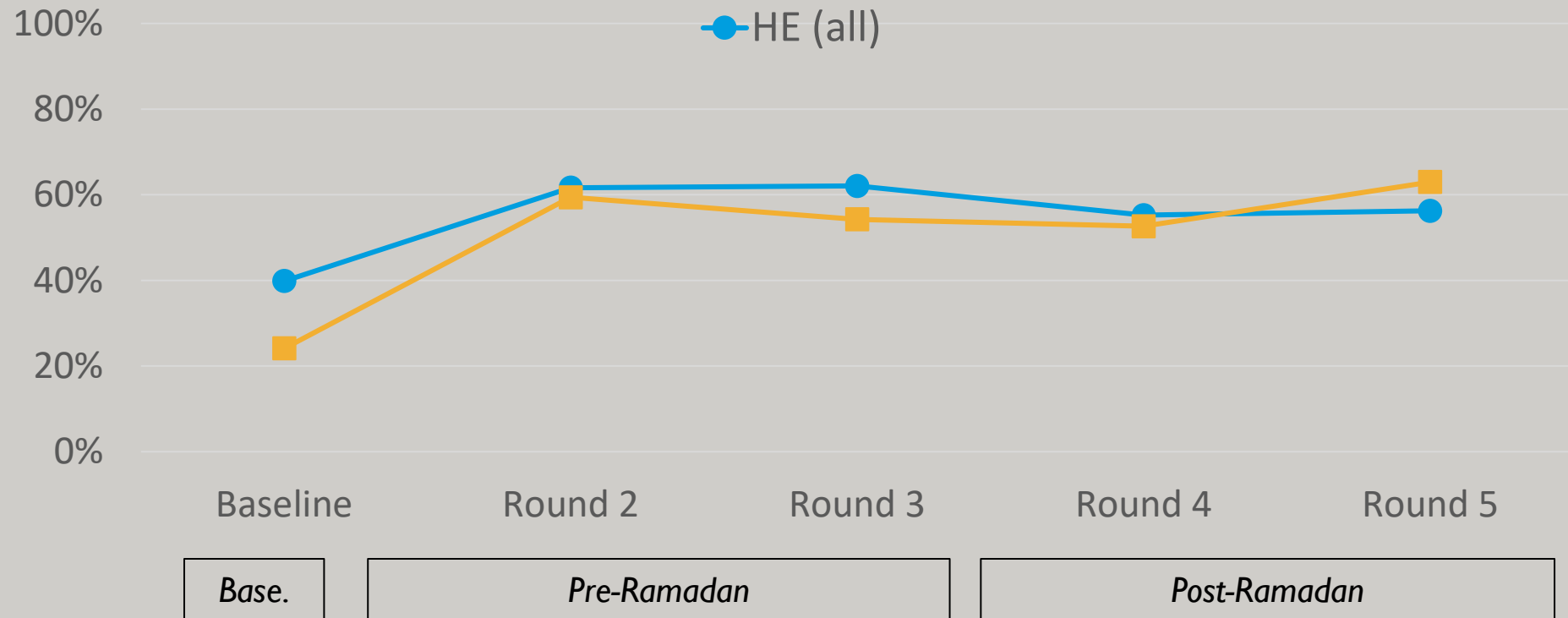
- Brick paths
- Painting foot prints
- Painting hand prints

Handwashing Education:

- 4 weekly sessions
- Covered:
 - When to wash hands
 - Why HWWS is important
 - How to wash hands
 - Life skills
- Handwashing demos
- Pledges and ceremony

HWWS by Round, HE (all) and Nudges (all)

Percentage of children HWWS with after known toileting events,
Nudge vs. HE

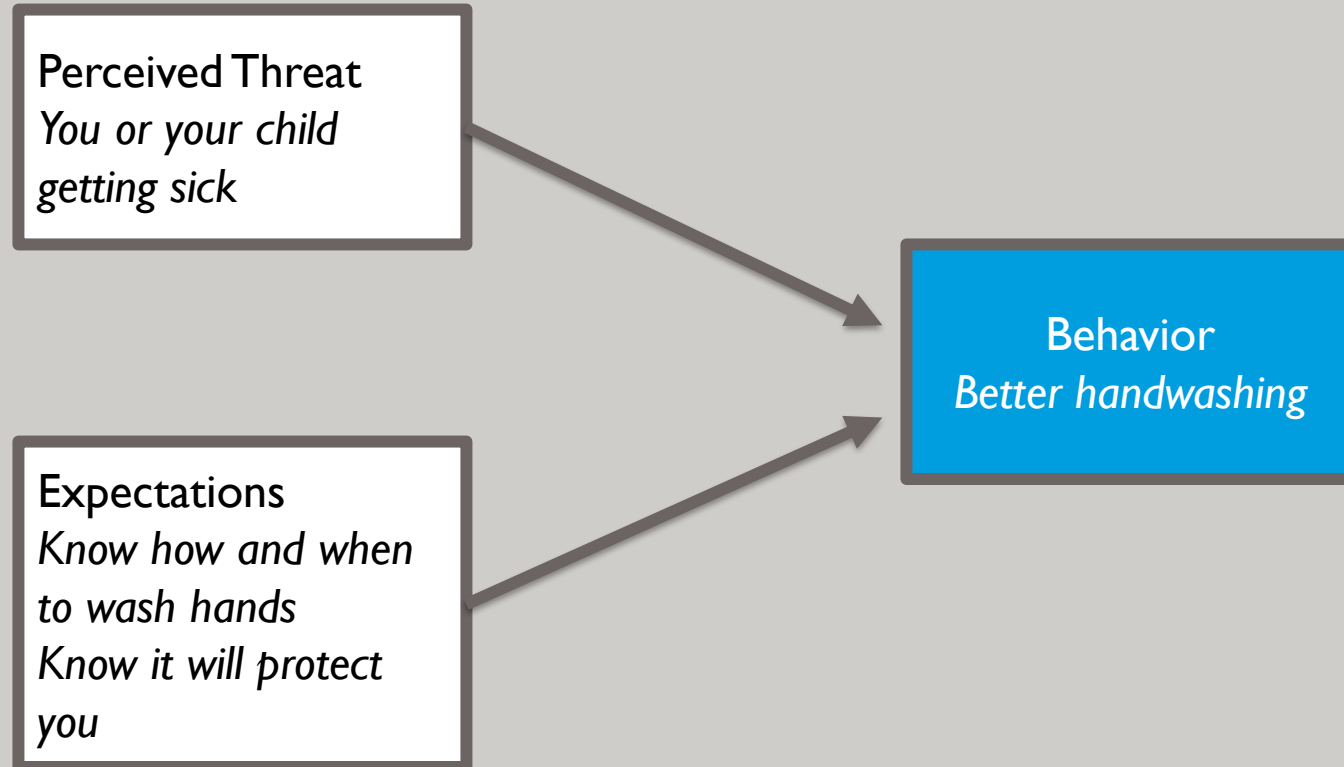


Regression models for HWWS Nudge vs. HE

- Nudges performed as well as high-intensity HE in all rounds
- No difference pre- or post-Ramadan holiday period

Nudge vs. HE	Adjusted Prevalence Ratio	95% CI
Baseline	1.44	0.75 – 2.77
Round 2	0.87	0.61 – 1.24
Round 3	0.95	0.68 – 1.31
Round 4	0.82	0.47 – 1.41
Round 5	1.04	0.68 – 1.58
Pre-Ramadan	0.90	0.68 – 1.18
Post-Ramadan	0.79	0.51 – 1.22
All follow-up	0.81	0.61 – 1.09

Changing Knowledge: The Health Belief Model (simplified)



Limitations to the Health Belief Model

- Assumes that behavior is routed in what people **know** and **think** about a specific behavior.
- Misses many of the possible factors that can shape behaviors
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Changing WASH Behaviours

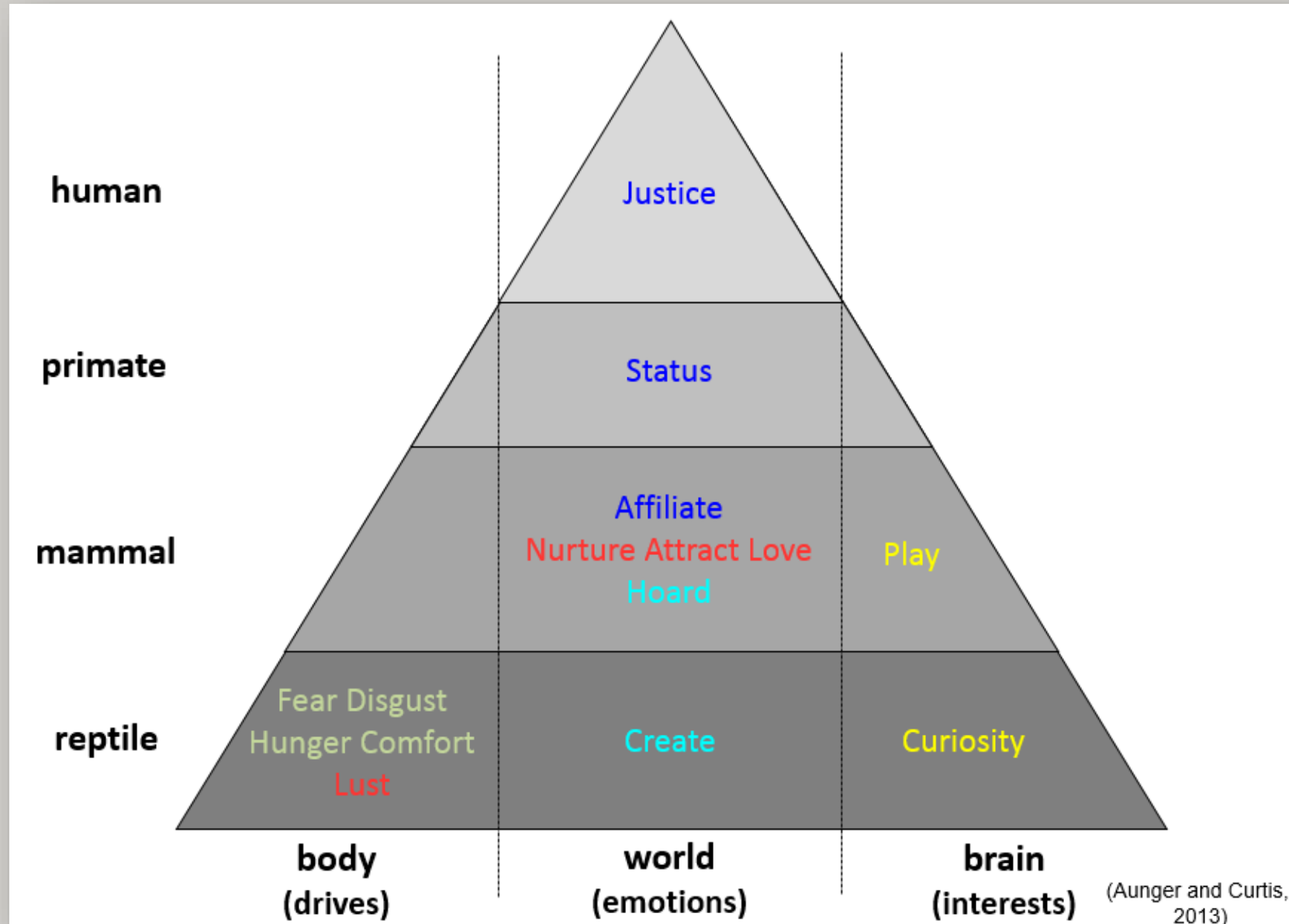
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adapted from De Bruck et al. 2017

	Likely Ineffective
	Mixed evidence
	Possibly effective
	Effective
	Insufficient data

Human Motives



Behaviour Centred Design



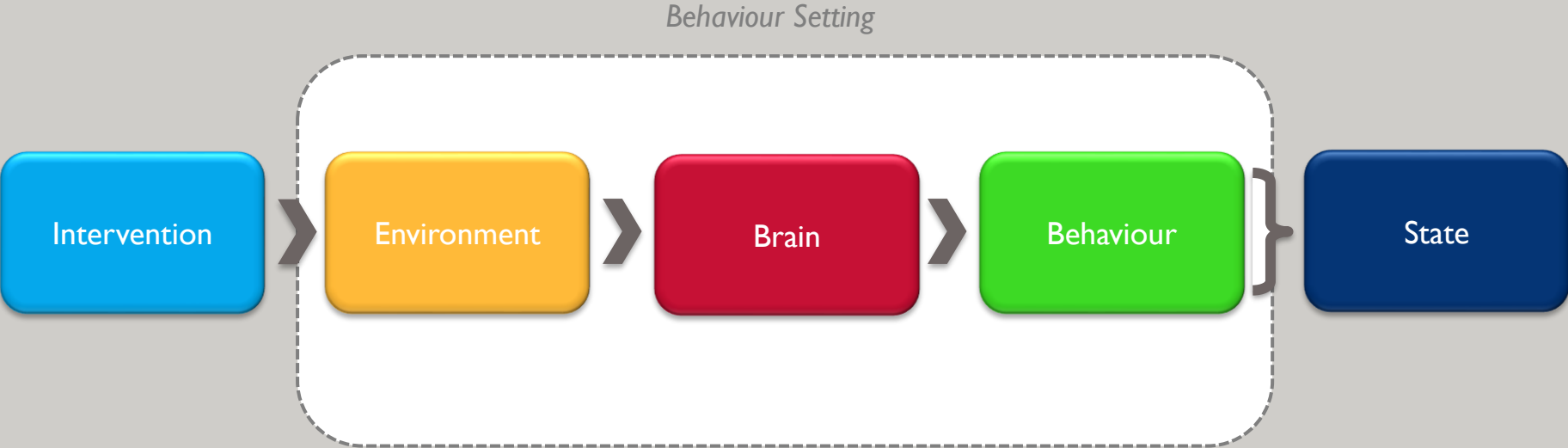
Currently the state of the art for understanding and changing behavior

Development drew heavily from the WASH sector

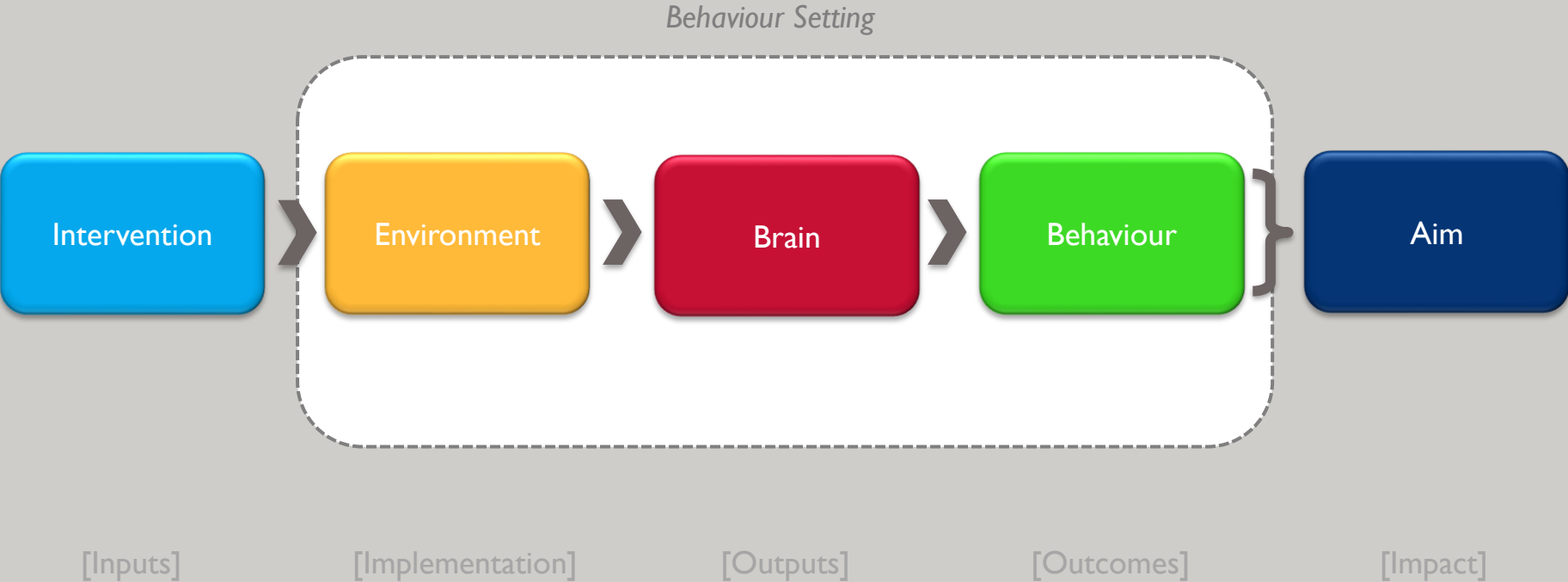
Includes

- Generic and flexible Theory of Change
- Grounding in current leading paradigms in neuropsychology, cognitive sciences, etc.
- Presents a comprehensive process for building, designing, and evaluating health behavior change interventions

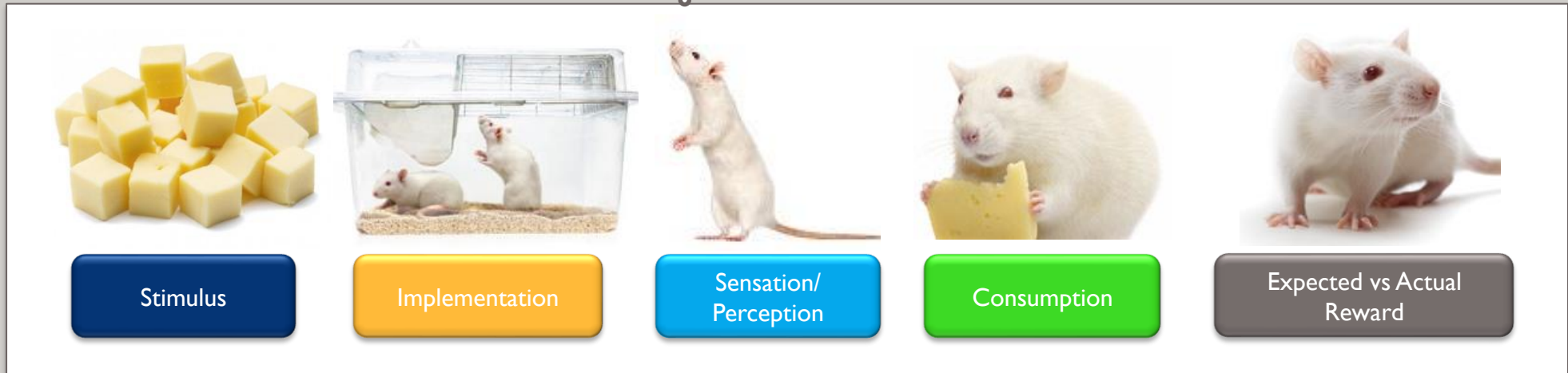
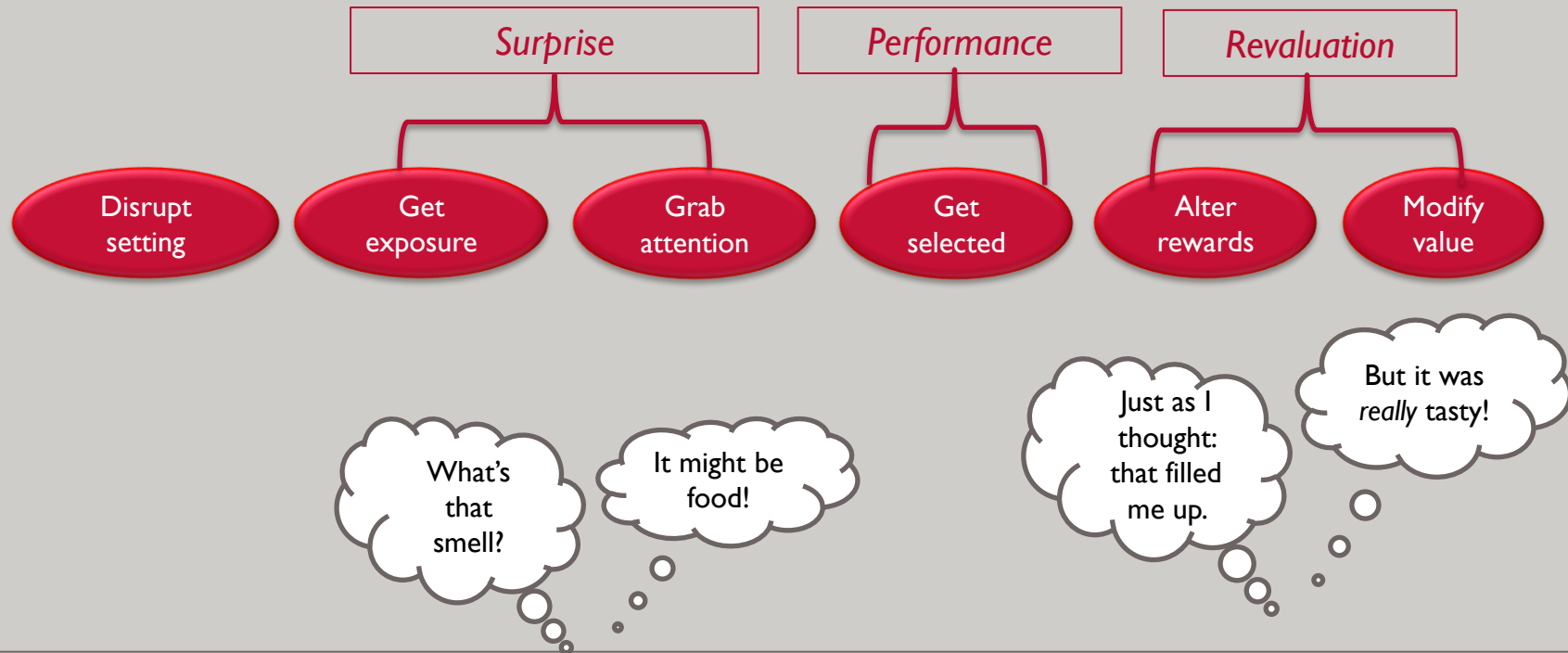
Behaviour Centred Design



Behaviour Centred Design



Reinforcement learning



[Intervention]

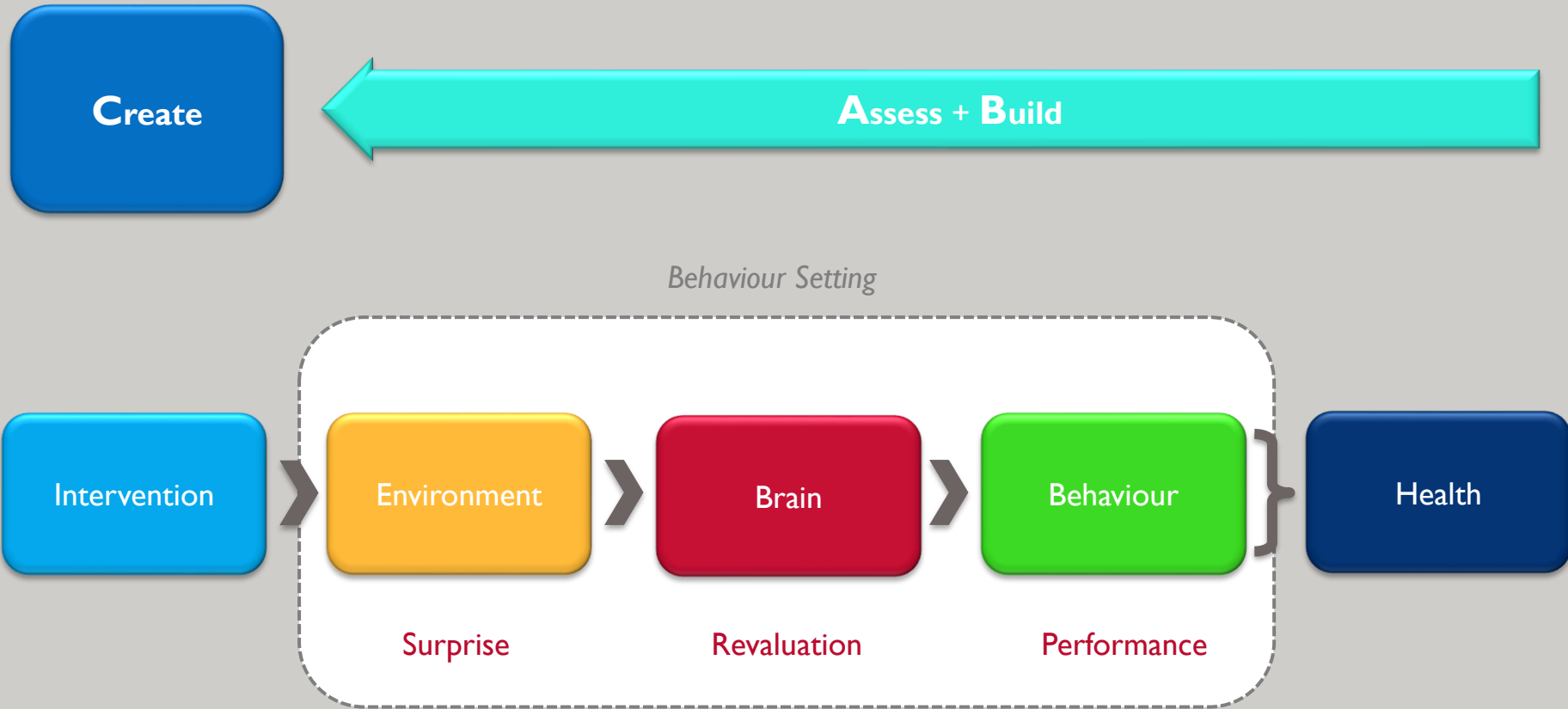
[Environment]

[Body]

[Behaviour]

[Brain]

Behaviour Centred Design



Create Surprise



GET EXPOSURE



GRAB ATTENTION

Cause Revaluation

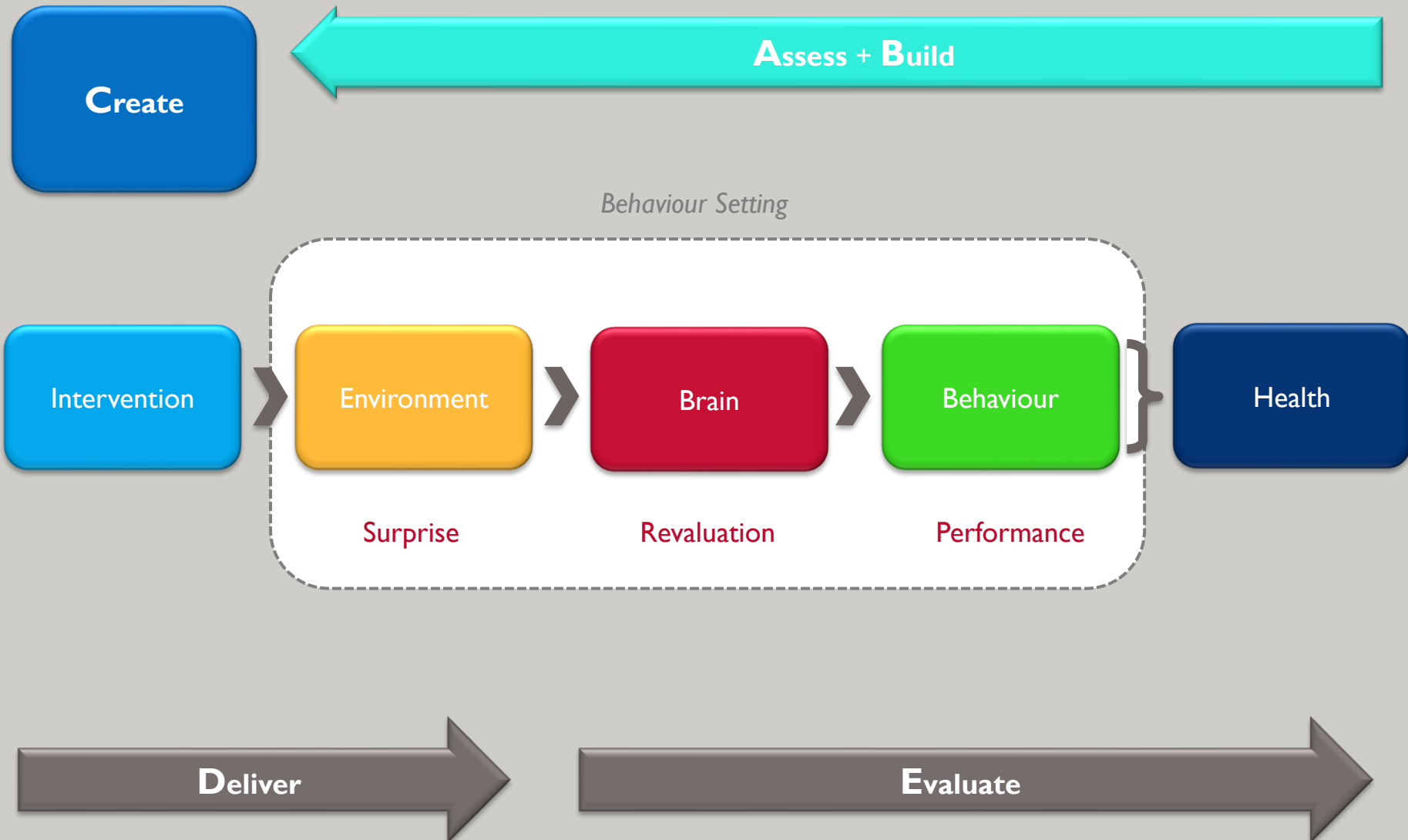


ALTER REWARDS



MODIFY VALUE

Behaviour Centred Design



Effect of a behaviour-change intervention on handwashing with soap in India (SuperAmma): a cluster-randomised trial

Adam Biran, Waf-Peter Schmidt, Kiruba Sankar Varadharajan, Divya Rajaraman, Raja Kumar, Katie Greenland, Balaji Gopalan, Robert Aunger, Val Curtis

Summary

Background Diarrhoea and respiratory infections are the two biggest causes of child death globally. Handwashing with soap could substantially reduce diarrhoea and respiratory infections, but prevalence of adequate handwashing is low. We tested whether a scalable village-level intervention based on emotional drivers of behaviour, rather than knowledge, could improve handwashing behaviour in rural India.

Methods The study was done in Chittoor district in southern Andhra Pradesh, India, between May 24, 2011, and Sept 10, 2012. Eligible villages had a population of 700–2000 people, a state-run primary school for children aged 8–13 years, and a preschool for children younger than 5 years. 14 villages (clusters) were selected, stratified by population size (<1200 vs >1200), and randomly assigned in a 1:1 ratio to intervention or control (no intervention). Clusters were enrolled by the study manager. Random allocation was done by the study statistician using a random number generator. The intervention included community and school-based events incorporating an animated film, skits, and public pledging ceremonies. Outcomes were measured by direct observation in 20–25 households per village at baseline and at three follow-up visits (6 weeks, 6 months, and 12 months after the intervention). Observers had no connection with the intervention and observers and participant households were told that the study was about domestic water use to reduce the risk of bias. No other masking was possible. The primary outcome was the proportion of handwashing with soap at key events (after defecation, after cleaning a child's bottom, before food preparation, and before eating) at all follow-up visits. The control villages received a shortened version of the intervention before the final follow-up round. Outcome data are presented as village-level means.

Findings Handwashing with soap at key events was rare at baseline in both the intervention and control groups (1% [SD 1] vs 2% [1]). At 6 weeks' follow-up, handwashing with soap at key events was more common in the intervention group than in the control group (19% [SD 21] vs 4% [2]; difference 15%, $p=0.005$). At the 6-month follow-up visit, the proportion handwashing with soap was 37% (SD 7) in the intervention group versus 6% (3) in the control group (difference 31%; $p=0.02$). At the 12-month follow-up visit, after the control villages had received the shortened intervention, the proportion handwashing with soap was 29% (SD 9) in the intervention group and 29% (13) in the control group.

Interpretation This study shows that substantial increases in handwashing with soap can be achieved using a scalable intervention based on emotional drivers.

Funding Wellcome Trust, SHARE.

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Introduction

Improved hand hygiene has the potential to reduce morbidity and mortality from infections spread by faecal-oral routes and person-to-person contact. Infections preventable by improved hand hygiene include gastrointestinal infections,^{1,2} respiratory infections,^{3,4} trachoma,⁵ fatal neonatal infections,^{6,7} and possibly worm infections.⁸ Diarrhoea and respiratory infections remain the two most important causes of child death globally.⁹ Improved hand hygiene can also improve child development and school attendance.^{10–11} Hygiene promotion has been suggested to be one of the most cost-effective interventions for prevention of infectious disease.¹⁴

Knowledge about the health benefits of handwashing is widespread. For example, 92% of respondents in Kenya

knew that germs on hands cause diarrhoea.¹⁵ However, in studies in several countries including India,¹⁶ Ghana,¹⁷ China,¹⁸ Bangladesh,¹⁹ and Kenya²⁰ only between 2% and 29% of participants washed their hands with soap after defecation or toilet use. Even in the UK, where soap and water are conveniently available and education levels are high, handwashing remains suboptimum from a public health perspective.^{21,22} These data suggest that effective behaviour change might need more than just communication of information.

Several social cognitive models are commonly used to explain health behaviours. These models, and the behaviour change interventions they inform, generally focus on beliefs about target behaviours.²³ By contrast, research²⁴ done by our group into the motivations underlying handwashing practice across several



Lancet Glob Health 2014; 2: e145–154

See Comment page e118

This online publication has been corrected. The corrected version first appeared at thelancet.com on February 27, 2014.

See Online for an audio

interview with Katie Greenland

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London, UK (A Biran PhD,

W P Schmidt PhD,

K Greenland MSc,

R Aunger PhD, V Curtis PhD);

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(K S Varadharajan MSc,

D Rajaraman PhD, R Kumar MSc);

and Centre of Gravity,

Bangalore, Karnataka, India

(B Gopalan B Tech)

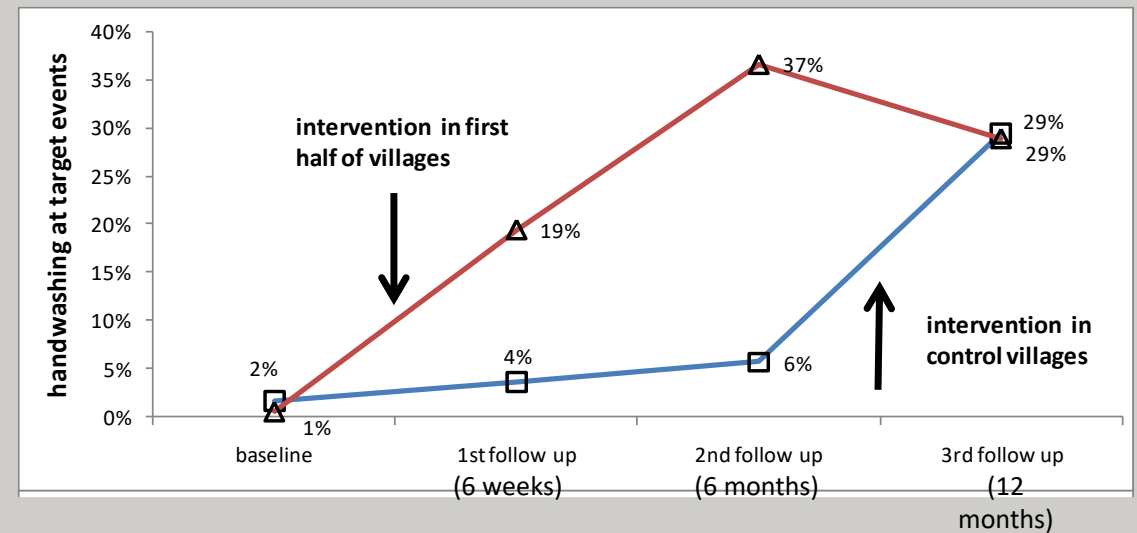
Correspondence:

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Conclusions

Behavior always has a function, but this function may not be adaptive in the current environment:

Even the simplest of behaviors is surprisingly complex

Not all of our behaviors are shaped by rational thought

Theories help us organize and analyze behaviors and behavior change in a systematic way

Conclusions

Behavior change is the basis of most WASH and nutrition interventions

We are still trapped in approaches that focus exclusively on knowledge and education, few that address the wider range of potential determinants.

Behavior is complex; therefore, theories are complex.

- Methods used in behavior change are often outside of traditional public health / development economics
- Knowledge may play an important role in initial behavior change, but it does not lead to sustained improvements
- Innovative approaches to behavior change focus on changing habits, providing automatic cues to change behaviors, and targeting emotional drivers of behavior
- Innovative approaches require adequate formative research