How can it be achieved that water- and sanitation facilities will actually be used by the population?

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Eawag: Swiss Federal Institute of Aquatic Science and Technology

Why is behavior change necessary?

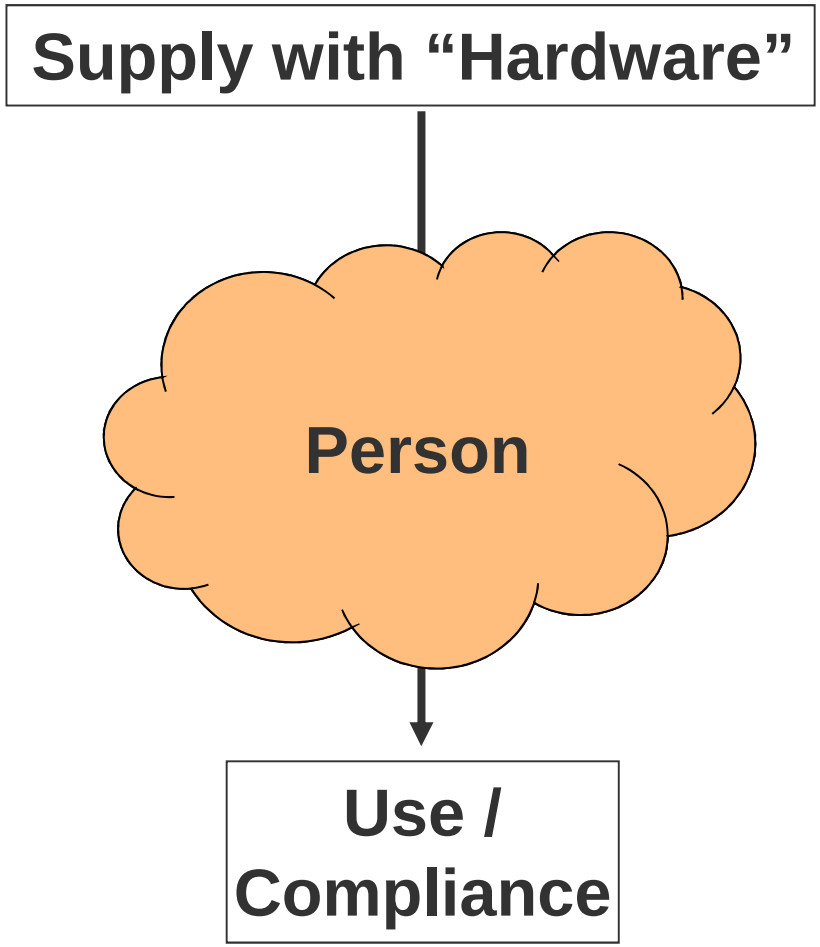
Without behavior change

- **people will not use any sanitation facilities**
- **people will not use household water treatment**
- **people will not show hygiene behavior**

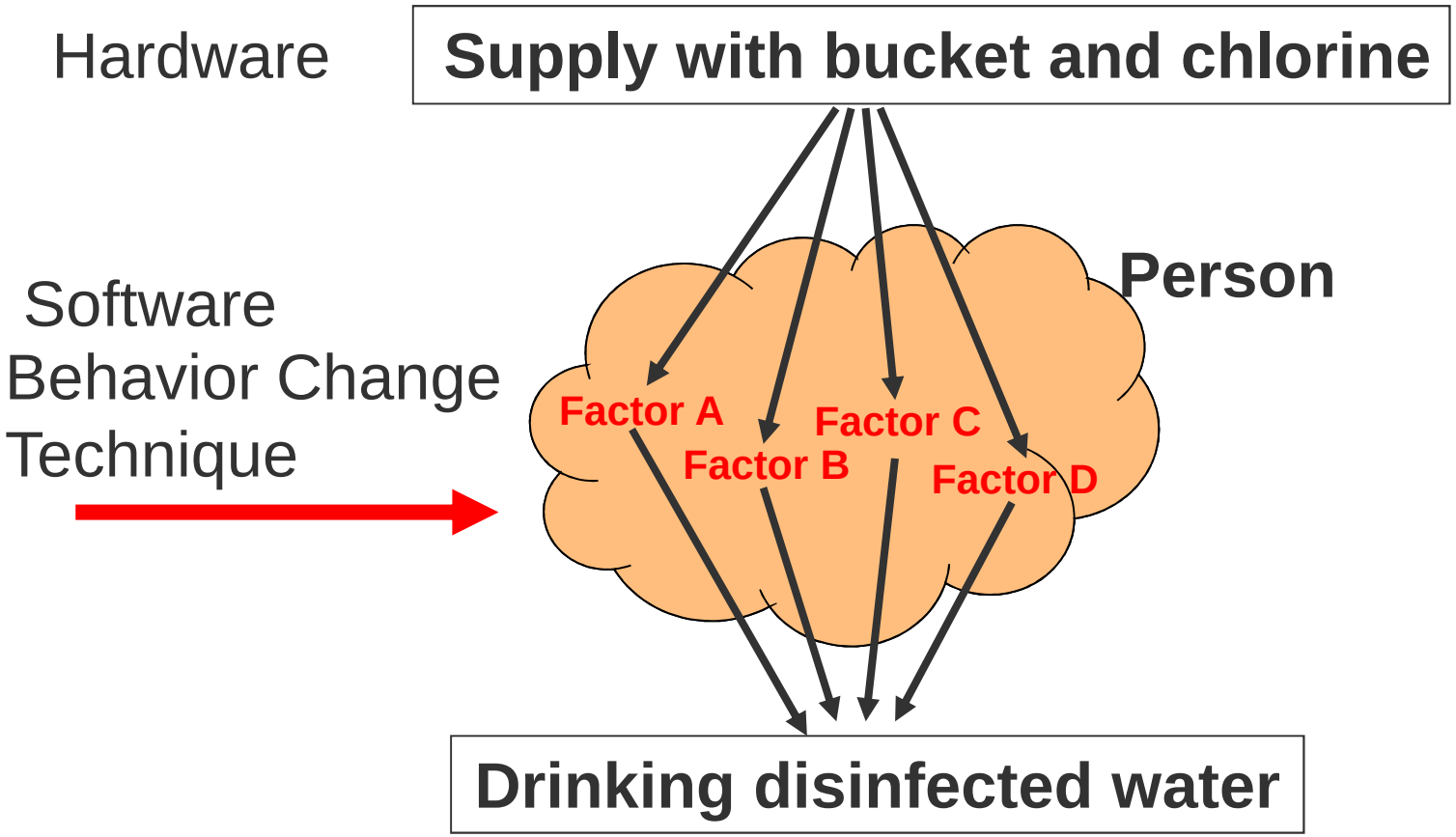
If compliance is too low

➔ no effect on health

What determines the Hardware Use ?



Behavioral Factors determine the Use of Hardware



If we know which behavioral factors are affected by the intervention
➔ then we can apply interventions more goal-oriented and improve strategies

How to do behavior change –
how is behavior change done so far:

a) *participatory planning tools* e.g. CLTS or PHAST
➔ no behavioral factors to be tackled defined

b) *qualitative formative research* to determine behavioral factors
➔ difficulty to group results in an objective way

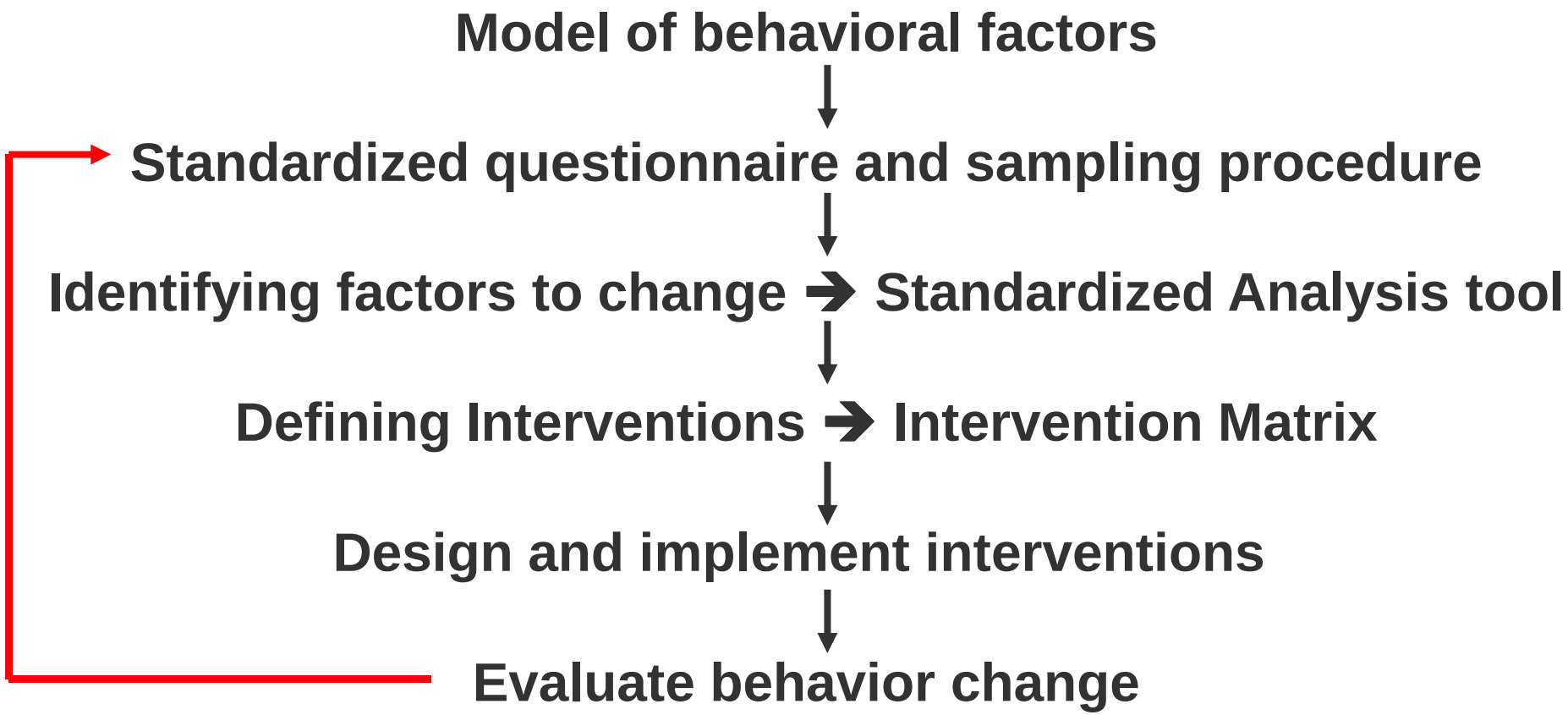
c) *layperson psychological understanding* to conceptualize behavioral factors, e.g. Knowledge-Attitude-Practice KAP-approach
➔ explanation of behavior insufficient

d) *psychological knowledge*, e.g. USAID Pakistan refers to 8 behavioral factors
➔ but do not use these for developing intervention strategies

How to do behavior change –
What is needed:

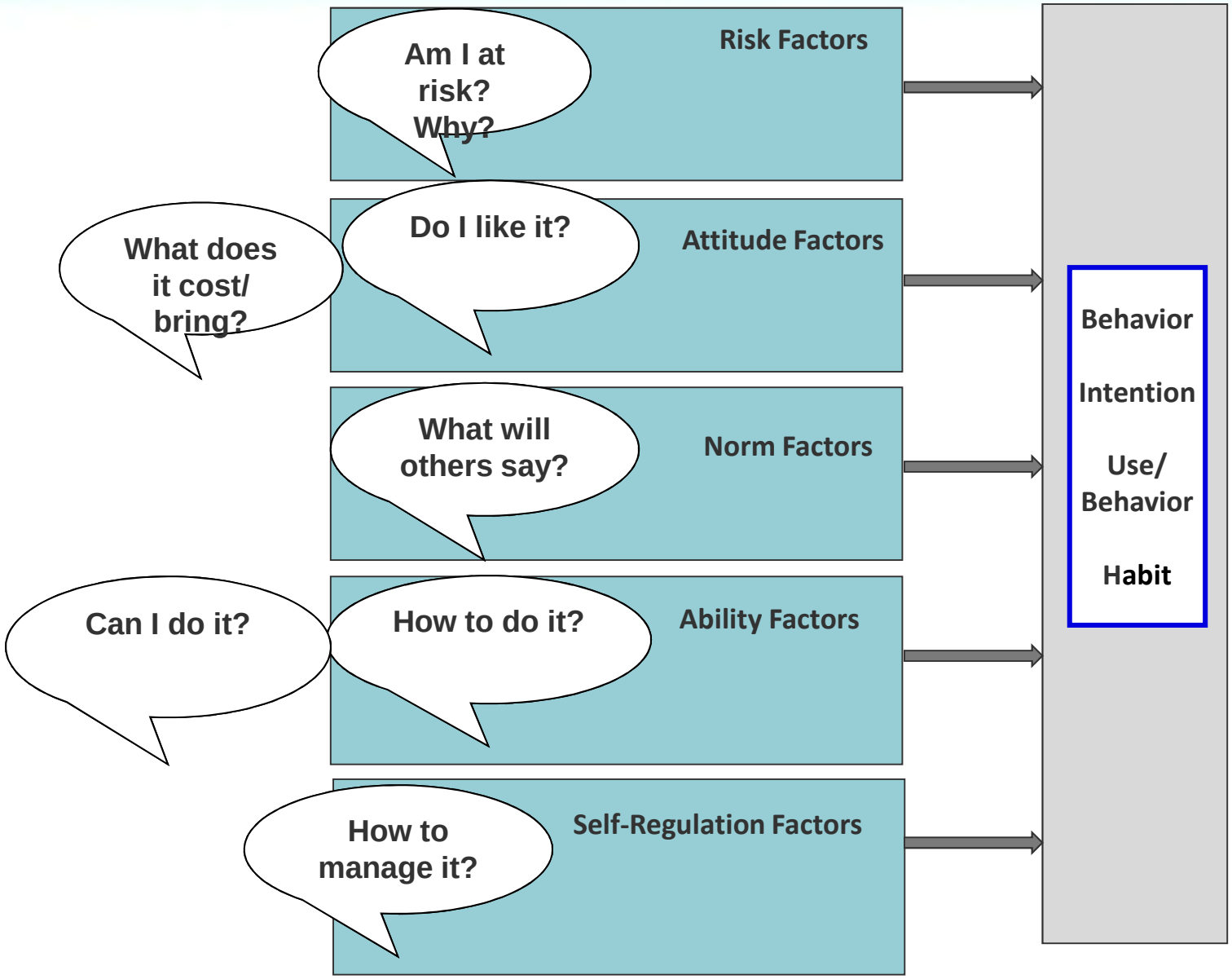
- A systematic of behavior steering factors
- A method to determine values, frequency, and strength of effect of the behavioral factors on behavior in the target population
- A guideline on how to derive interventions which tackle the behavioral factors
- A method on how to evaluate the effects of implemented interventions on behavioral factors and the target behavior

Evidence-based Behavior Change Protocol

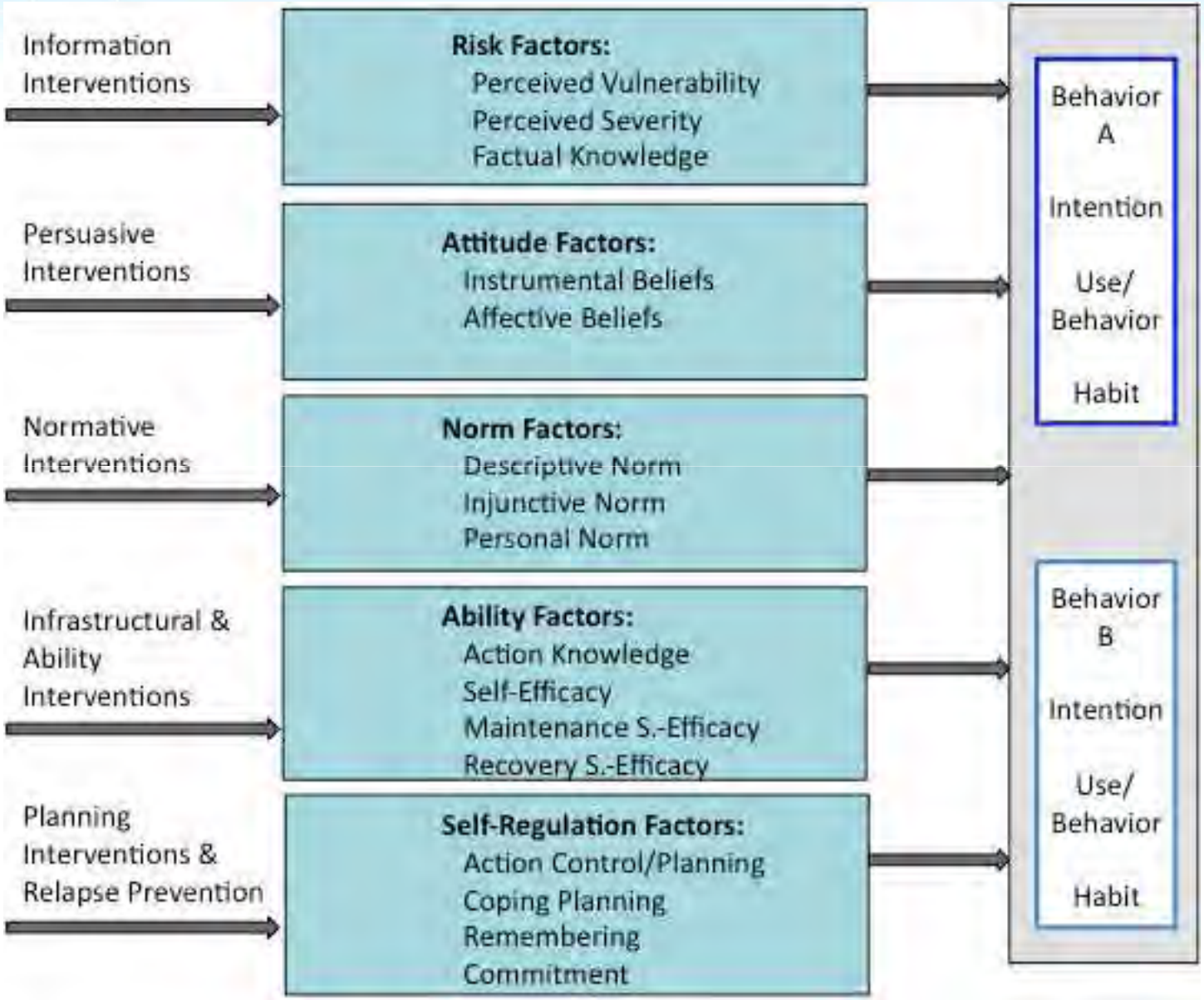



What will others say?
How to manage it?
What does it cost/ bring?
Am I at risk? Why?
Do I like it?
Can I do it?
eawag
aquatic research

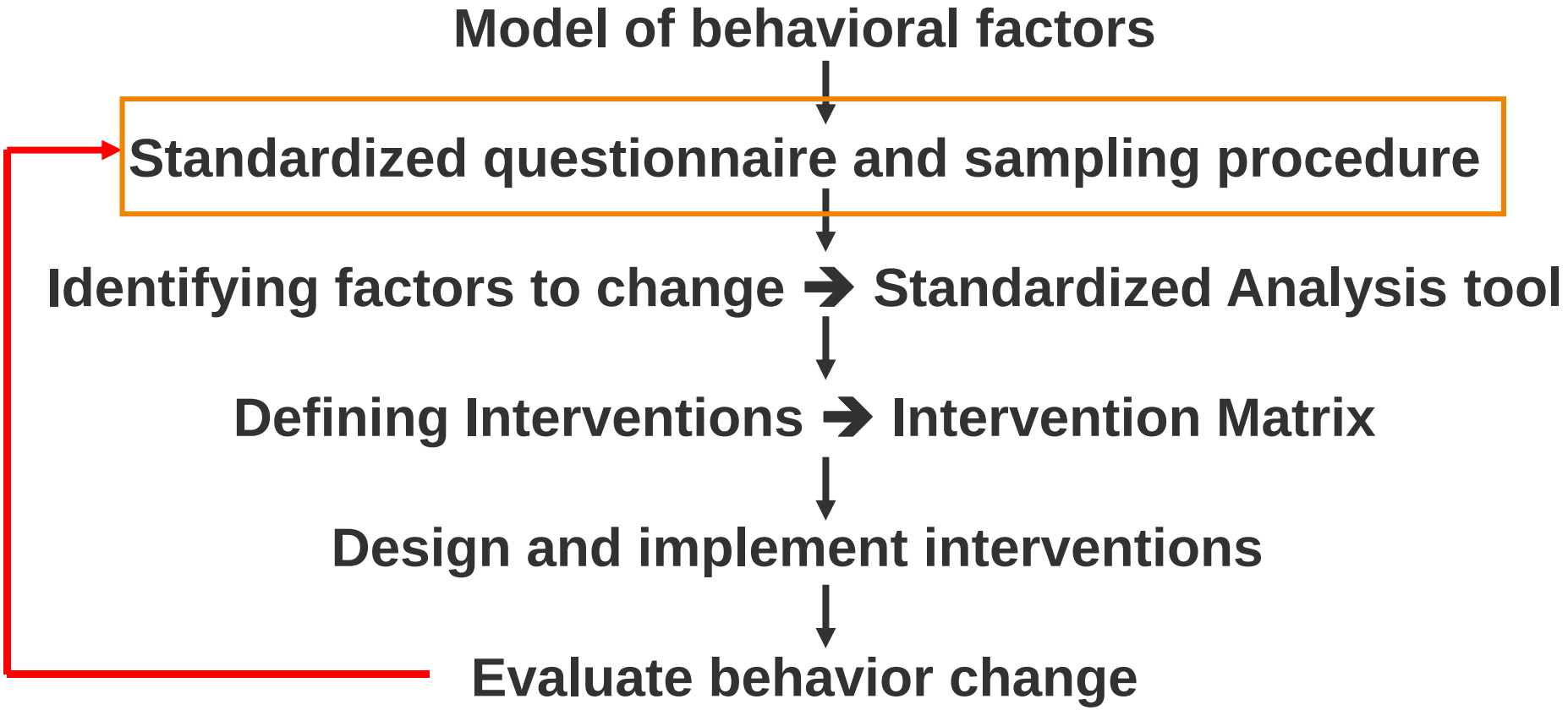
Psychological factors for behavior change



The RANAS-Model: Risk, Attitudes, Norms, Ability and Self-regulation



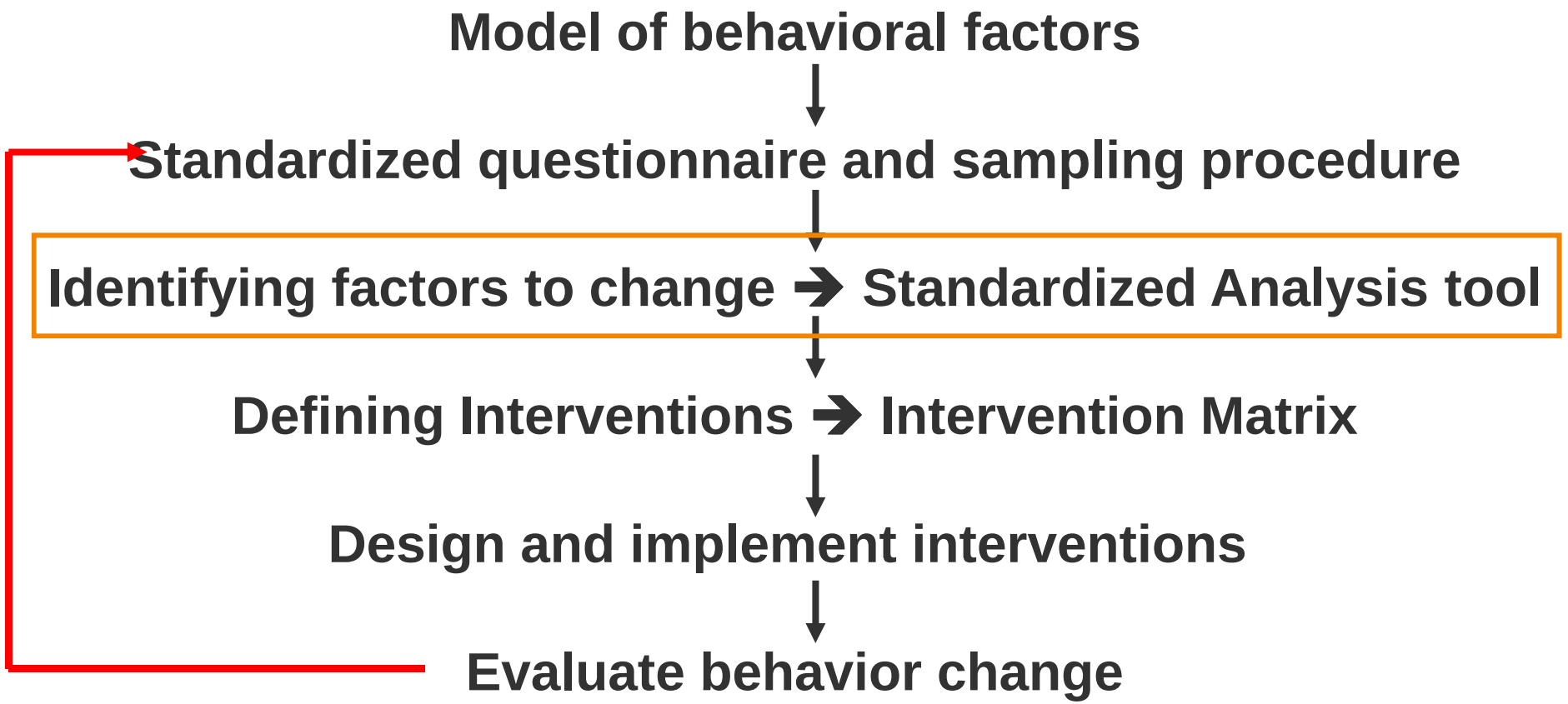
Evidence-based Behavior Change Protocol



Measure factors with questionnaire

Construct	Item example
Knowledge	Open-ended: Can you tell me how you can contract diarrhea? → 1 point per correct answer → sum score.
Vulnerability	How high or low are the chances that you can get diarrhea when drinking raw water? (very high – very low)
Severity	If you got diarrhea, how severely would that impact your social life? (not at all – very severe)
Attitude	How much do you like or dislike drinking SODIS water / raw water? (dislike very much – like very much)
Injunctive norm	How proud or ashamed are you to offer SODIS water to your guests? (very ashamed – very proud)
Descriptive norm	How many people of your relatives drink SODIS water / raw water? (none of them – all of them)
Self-efficacy	Are you sure that you can produce as much SODIS water as you need within the next month? (very unsure – very sure)
Coping planning	Have you made a plan regarding what to do when you are hindered to do SODIS? (no detailed plan – very detailed plan)

Evidence-based Behavior Change Protocol

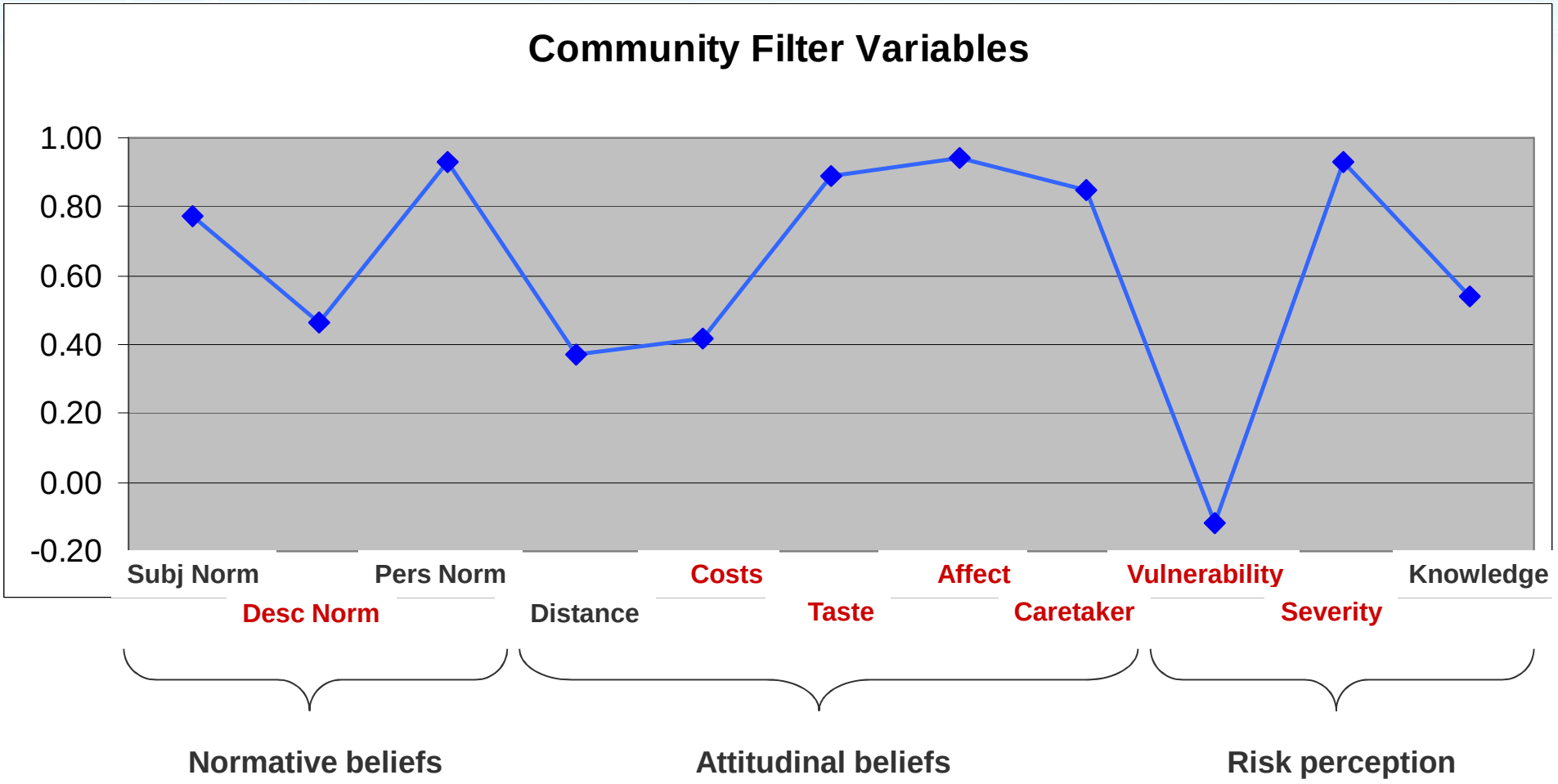


Fluoride removal community filter

Bone char & contact precipitation Filter

- Charred animal bone
- Ca and PO4 pellets

Behavior enhancing factors



Data Analysis (Example)

Statistical relationships between behavioral factors and the behavior indicate causes of the behavior

200 interviews

Injunctive Norm

Sodis Use

	Not proud	proud	Very proud
little	50	10	7
medium	9	50	8
high	8	8	50

The more somebody is poud of … the more he/she does ….

Behavior enhancing factors

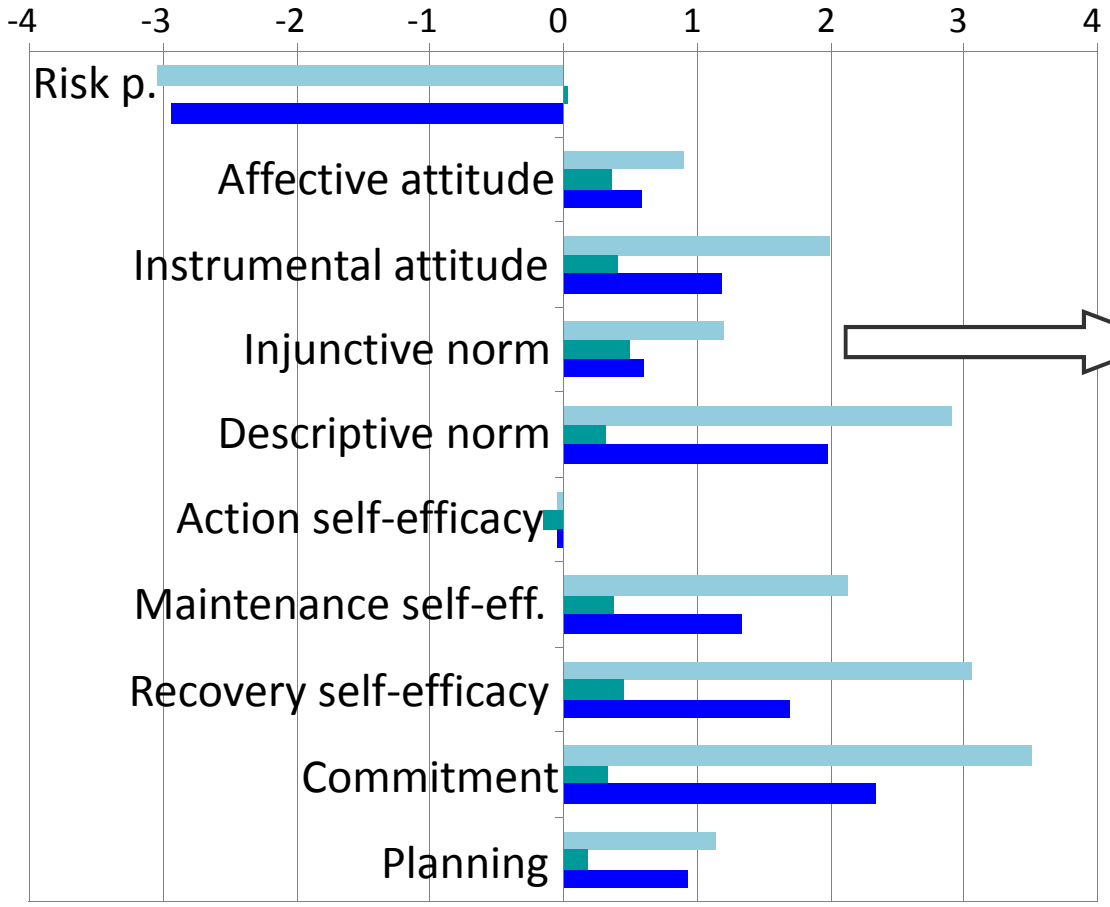
Linear regression analysis: Enter Method; AV = Fetching water at CF

	Factor	*B*	*SE B*	*β*	*p*	*VIF*
	Constant	1.33	0.29		0.00	
Social Norms	Subjective norm	0.07	0.10	0.05	0.50	1.44
	Descriptive norm	**0.50**	**0.10**	**0.32**	**0.00**	**1.13**
	Personal norm	0.19	0.15	0.09	0.21	1.30
Situation	**Costs**	**0.11**	**0.03**	**0.22**	**0.00**	**1.26**
	Distance	0.00	0.09	0.00	0.97	1.13
Attitude	**Taste**	**0.55**	**0.14**	**0.30**	**0.00**	**1.46**
	Affect	**0.70**	**0.32**	**0.17**	**0.03**	**1.56**
	Caretaker	**0.25**	**0.08**	**0.22**	**0.00**	**1.37**
Risk perception	**Vulnerability**	**0.27**	**0.03**	**0.23**	**0.04**	**1.37**
	Severity	**0.31**	**0.17**	**0.13**	**0.05**	**1.18**
	Knowledge	0.08	0.09	0.07	0.37	1.47

Note: Adjusted R^2 = .417 (p < .001).

Predictors of arsenic-safe water use and their intervention potentials

N = 744



Intervention potential

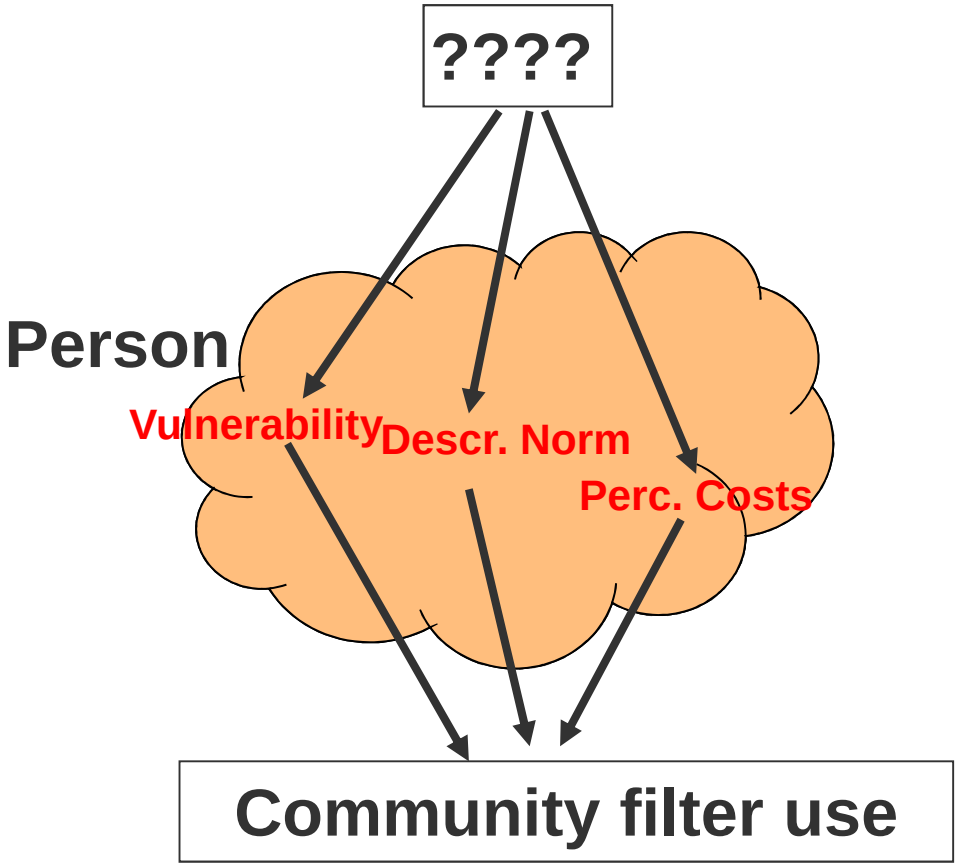
= (Target – M) * B

Example inj. norm:

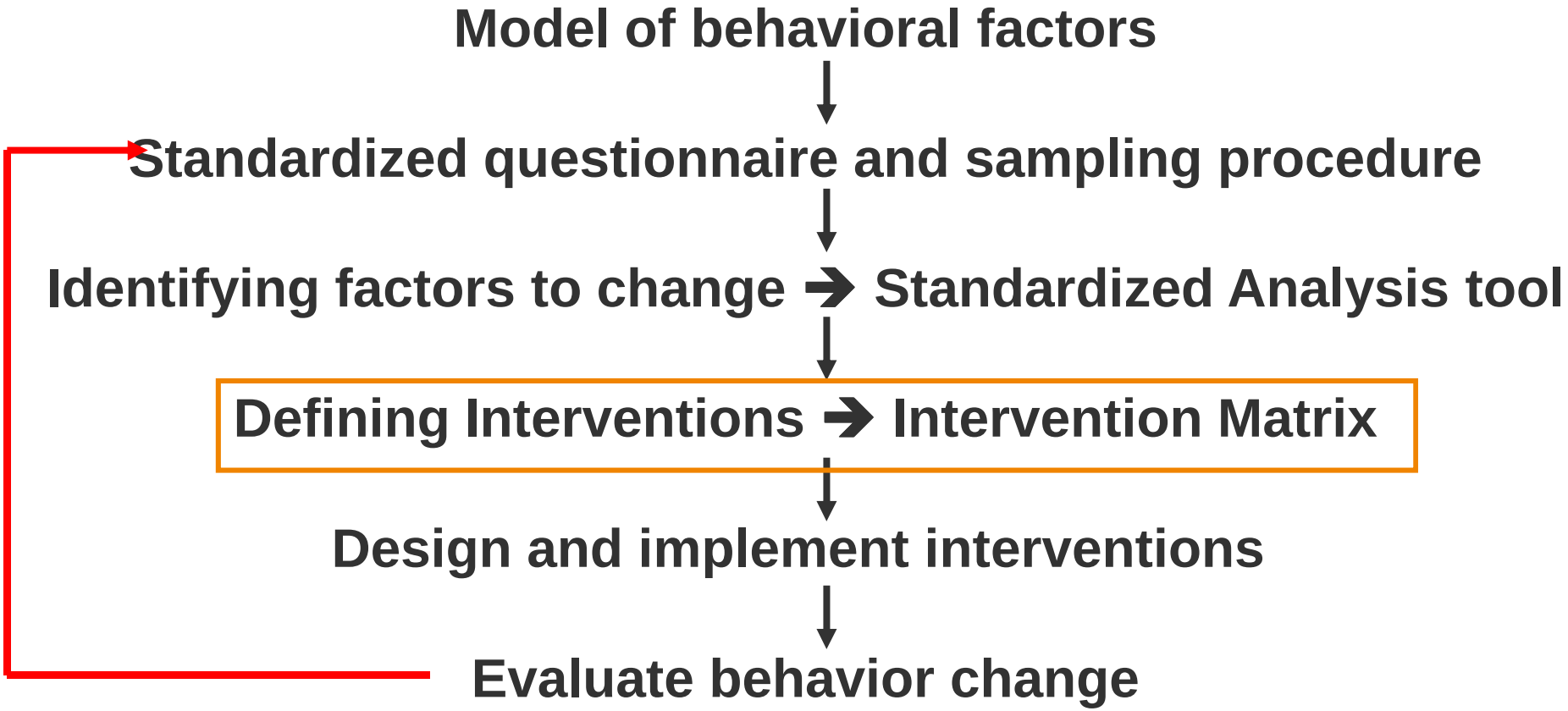
(1 – 0.5) * 1.2 = 0.6

B (regression coefficient) Mean Intervention potential (T-M) * B

Which behavior change techniques?



Evidence-based Behavior Change Protocol



Intervention Matrix: Which intervention techniques change which factors?

	Factors	Behavior Interventions
Information Interventions	Personal Vulnerability	➢ Personal risk information
	Perceived Severity	➢ Showing risk scenarios ➢ Fear arousal
Persuasive Interventions	Instrumental Beliefs	➢ Persuasive arguments ➢ Persuasive peripheral cues
	Affective Beliefs	➢ Affective persuasion
Normative Interventions	Descriptive Norm	➢ Modeling ➢ Public Commitment
	Injunctive Norm	➢ Highlighting Norms
Infrastructural & Ability Interventions	Self-Efficacy	➢ Guided Practice
	Action Knowledge	➢ Training Behavior
Planning Interventions & Relapse Prevention	Action Control	➢ Prompts ➢ Stimulus Control
	Planning	➢ Daily Routine Planning
		➢ Relapse Coping

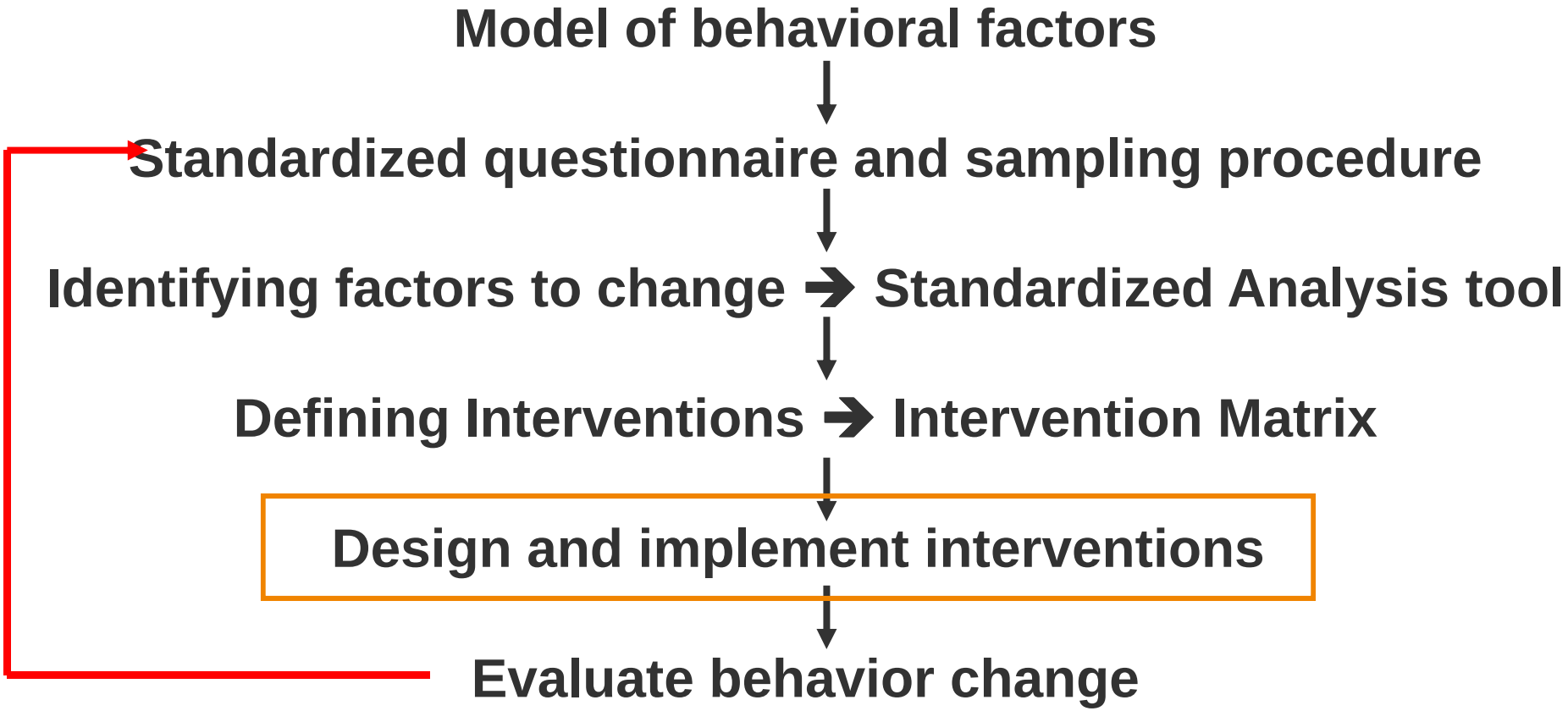
Self-Regulation Processes	
Factors	**Behavior Interventions: Planning Interventions & Relapse Prevention**
Action Control/Planning: during the realization of a behavior, other goals and old habits may arise and take over the guidance of the behavior.	**Setting goals related to the new behavior: set a challenging goal together with the person which is feasible but somewhat difficult.** **Stimulus control: remove reminders or cues to engage in old behaviors and add cues or reminders to engage in the new behavior.** **Outcome feedback: the effects of the new behavior can be reported back to the person or the person herself controls for these effects (self-feedback).** **Contingency management: increasing the rewards (e.g. financial, material, etc.) for positive behavioral change.**
Coping Planning: anticipation of barriers and the generation of alternative behaviors to overcome them	**Daily routine planning: it is discussed with the person about when and where in the daily routine the new behavior can be integrated.**
Remembering/Forgetting: the person may report that he/she forgets to perform the behavior many times.	**Forming implementation intentions: to stimulate a person to formulate, when, where, and how to intend to achieve his or her goals.** **Prompts: are cues (memory aids) set by the person which trigger the behavior in the right situation.**

Define Interventions: Which communication channel to use?

Commu-nication Channel

Communication Channels	
Mass Media Channel	
Print media: **Newspaper, brochure, leaflets, internet**	**Mass media role modeling** **Entertainment education** **Behavioral journalism**
Audio-visual media: **Radio, television, loudspeaker system or car**	
Interpersonal Channels	
Promoters	**Persons are hired and trained advertise house by house**
Opinion leaders	**Voluntary social workers, trained to promote the new behavior in their social network.**
Small group training	**Meetings to discuss and train the introduction of a new behavior**
Mobilizing social networks	**Linking members to new networks by mentor programs, buddy systems, and self-help groups**
Peer-to-Peer	**People are induced to talk about the new behavior**

Evidence-based Behavior Change Protocol for Emergency Context



Interventions to increase community filter usage

General recommendations	Evidence-based
Promotion manuals (NGO approach) → mostly recommended	Baseline survey (research)
→ Awareness creation → risk perception	→ highest intervention potential → influence + potential to increase

Perceived vulnerability

Perceived costs

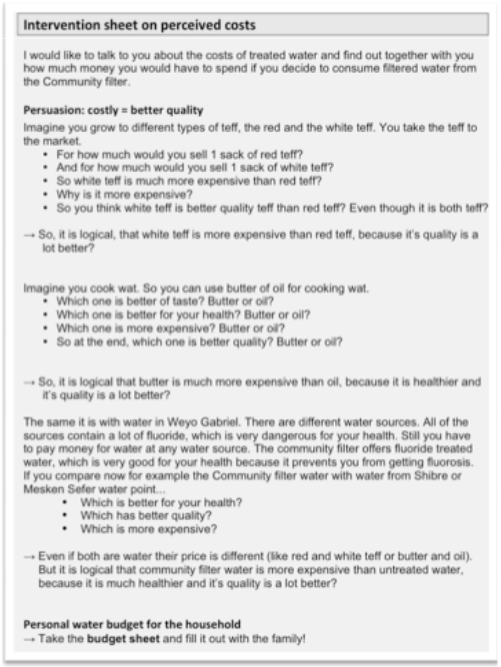
Persuasion on perceived costs

Higher price = better quality

- Examples with common things (red teff vs. white teff, oil vs. butter)

Personal water budget

- Promoter calculates water consumption of family
- How much water do they need from community filter?
- How much money does it cost?



Intervention sheet on perceived costs

I would like to talk to you about the costs of treated water and find out together with you how much money you would have to spend if you decide to consume filtered water from the Community filter.

Persuasion: costly = better quality

Imagine you grow to different types of teff, the red and the white teff. You take the teff to the market.

- For how much would you sell 1 sack of red teff?
- And for how much would you sell 1 sack of white teff?
- So white teff is much more expensive than red teff?
- Why is it more expensive?
- So you think white teff is better quality teff than red teff? Even though it is both teff?

→ So, it is logical, that white teff is more expensive than red teff, because it's quality is a lot better?

Imagine you cook wat. So you can use butter of oil for cooking wat.

- Which one is better of taste? Butter or oil?
- Which one is better for your health? Butter or oil?
- Which one is more expensive? Butter or oil?
- So at the end, which one is better quality? Butter or oil?

→ So, it is logical that butter is much more expensive than oil, because it is healthier and it's quality is a lot better?

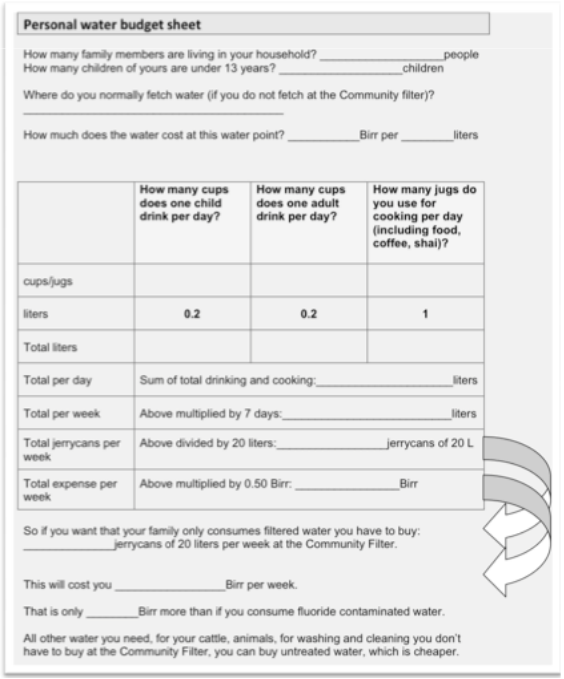
The same it is with water in Weyo Gabriel. There are different water sources. All of the sources contain a lot of fluoride, which is very dangerous for your health. Still you have to pay money for water at any water source. The community filter offers fluoride treated water, which is very good for your health because it prevents you from getting fluorosis. If you compare now for example the Community filter water with water from Shibre or Mesken Sefer water point…

- Which is better for your health?
- Which has better quality?
- Which is more expensive?

→ Even if both are water their price is different (like red and white teff or butter and oil). But it is logical that community filter water is more expensive than untreated water, because it is much healthier and it's quality is a lot better?

Personal water budget for the household

→ Take the **budget sheet** and fill it out with the family!



Personal water budget sheet

How many family members are living in your household? _____people
How many children of yours are under 13 years? _____children

Where do you normally fetch water (if you do not fetch at the Community filter)?
_____

How much does the water cost at this water point? _____Birr per _____liters

	How many cups does one child drink per day?	How many cups does one adult drink per day?	How many jugs do you use for cooking per day (including food, coffee, shai)?
cups/jugs			
liters	0.2	0.2	1
Total liters			
Total per day	Sum of total drinking and cooking: _____liters		
Total per week	Above multiplied by 7 days: _____liters		
Total jerrycans per week	Above divided by 20 liters: _____jerrycans of 20 L		
Total expense per week	Above multiplied by 0.50 Birr: _____Birr		

So if you want that your family only consumes filtered water you have to buy:
_____jerrycans of 20 liters per week at the Community Filter.

This will cost you _____Birr per week.

That is only _____Birr more than if you consume fluoride contaminated water.

All other water you need, for your cattle, animals, for washing and cleaning you don't have to buy at the Community Filter, you can buy untreated water, which is cheaper.

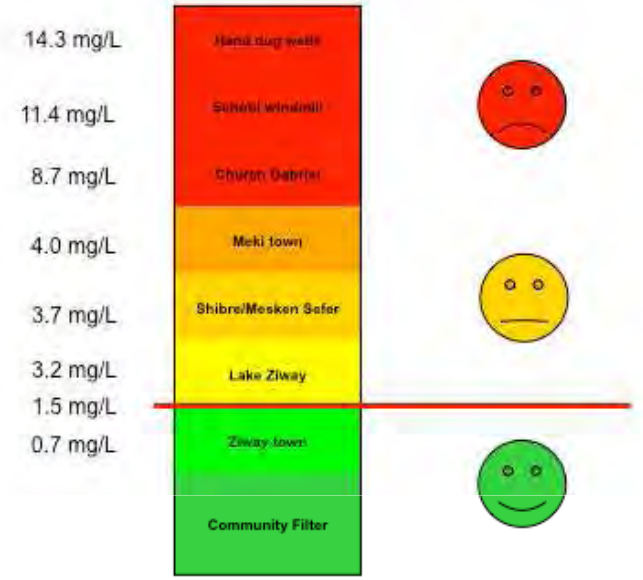
Persuasion on children‘s vulnerability

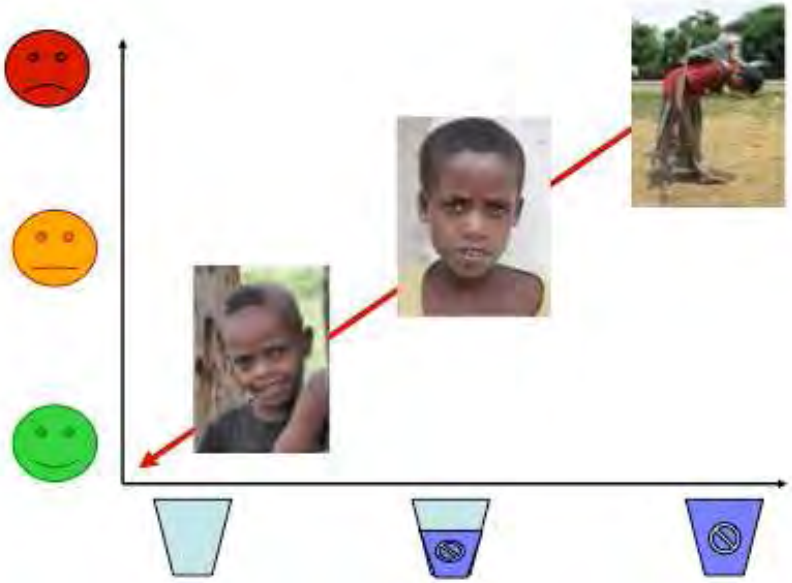
1) Current water source contaminated

2) Personal risk information for all children

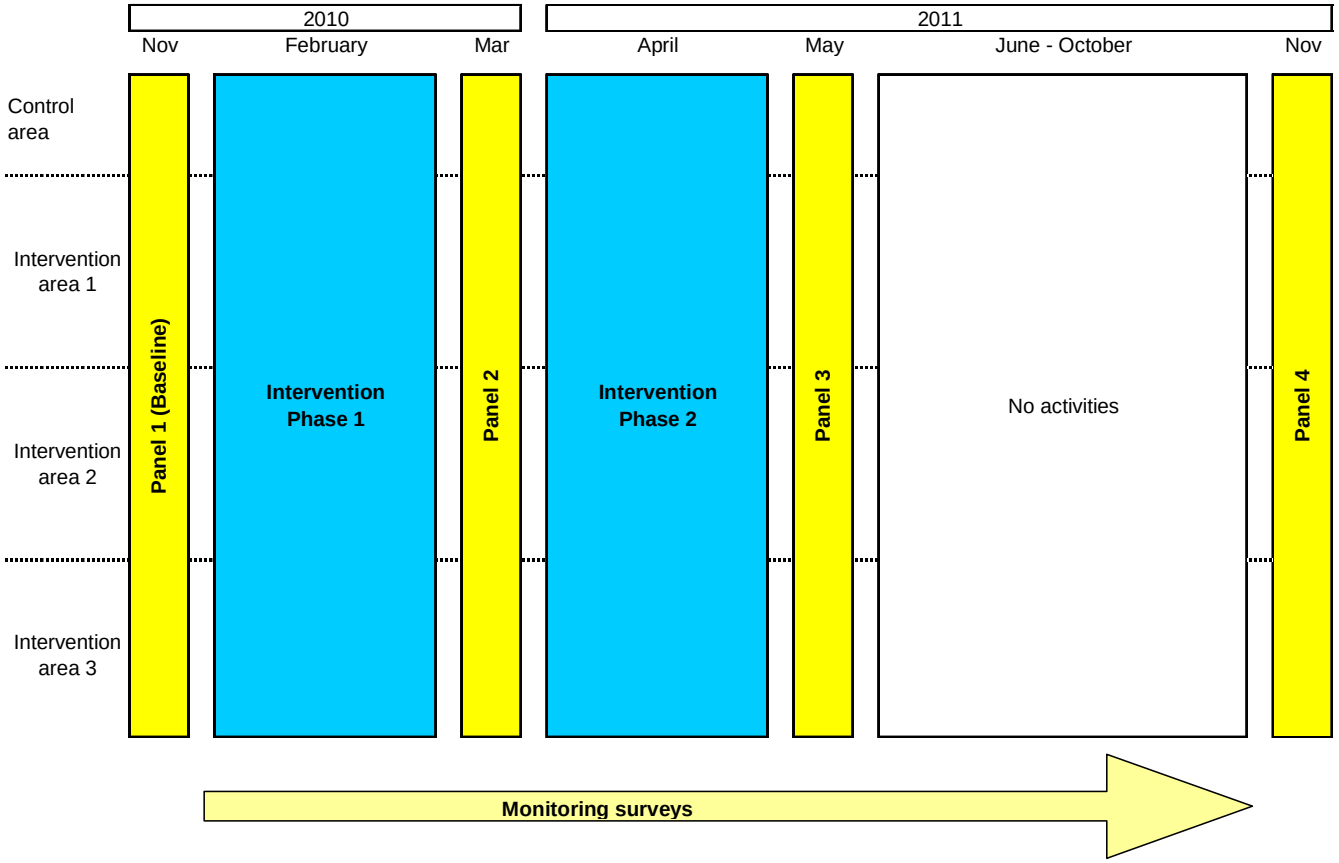
→ Individualized undeniable messages!

3) What can you do?

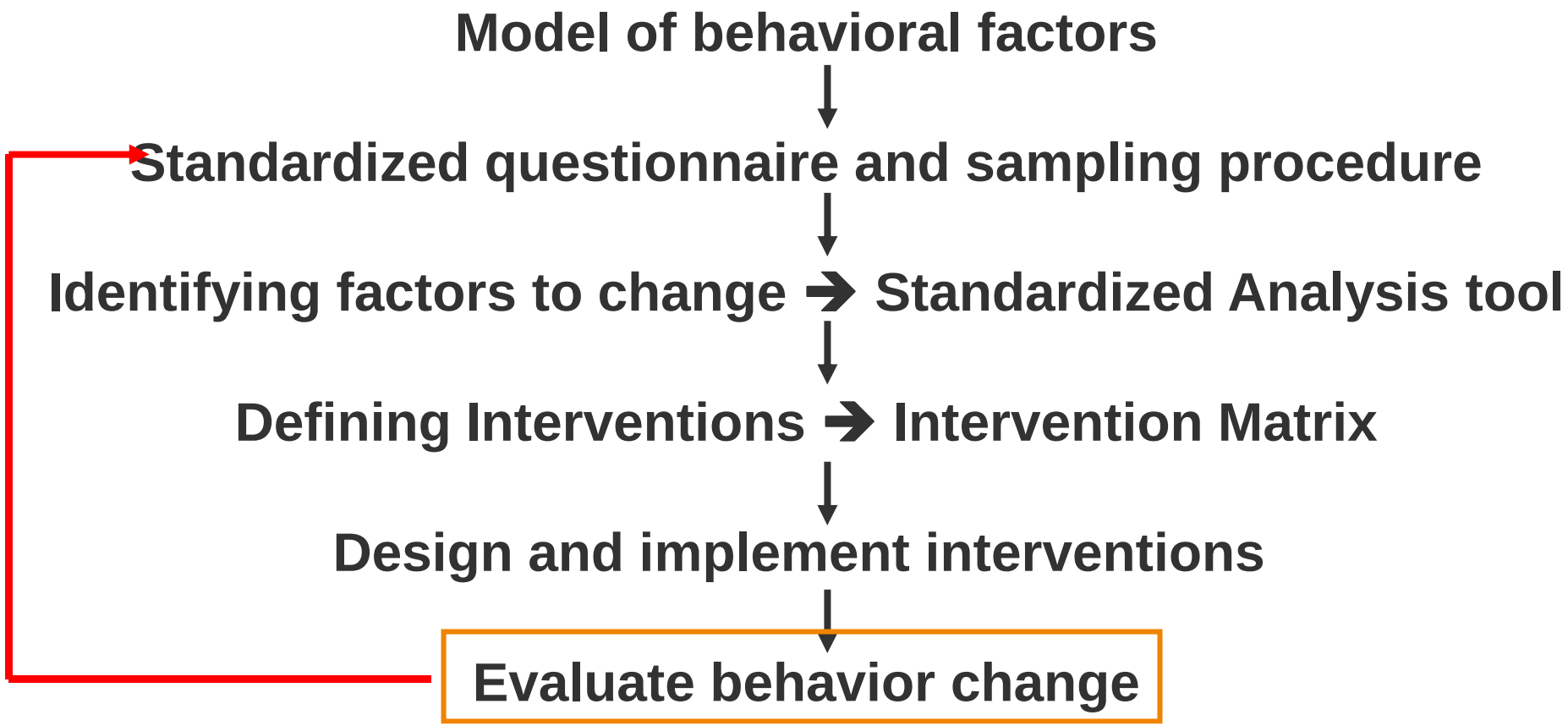




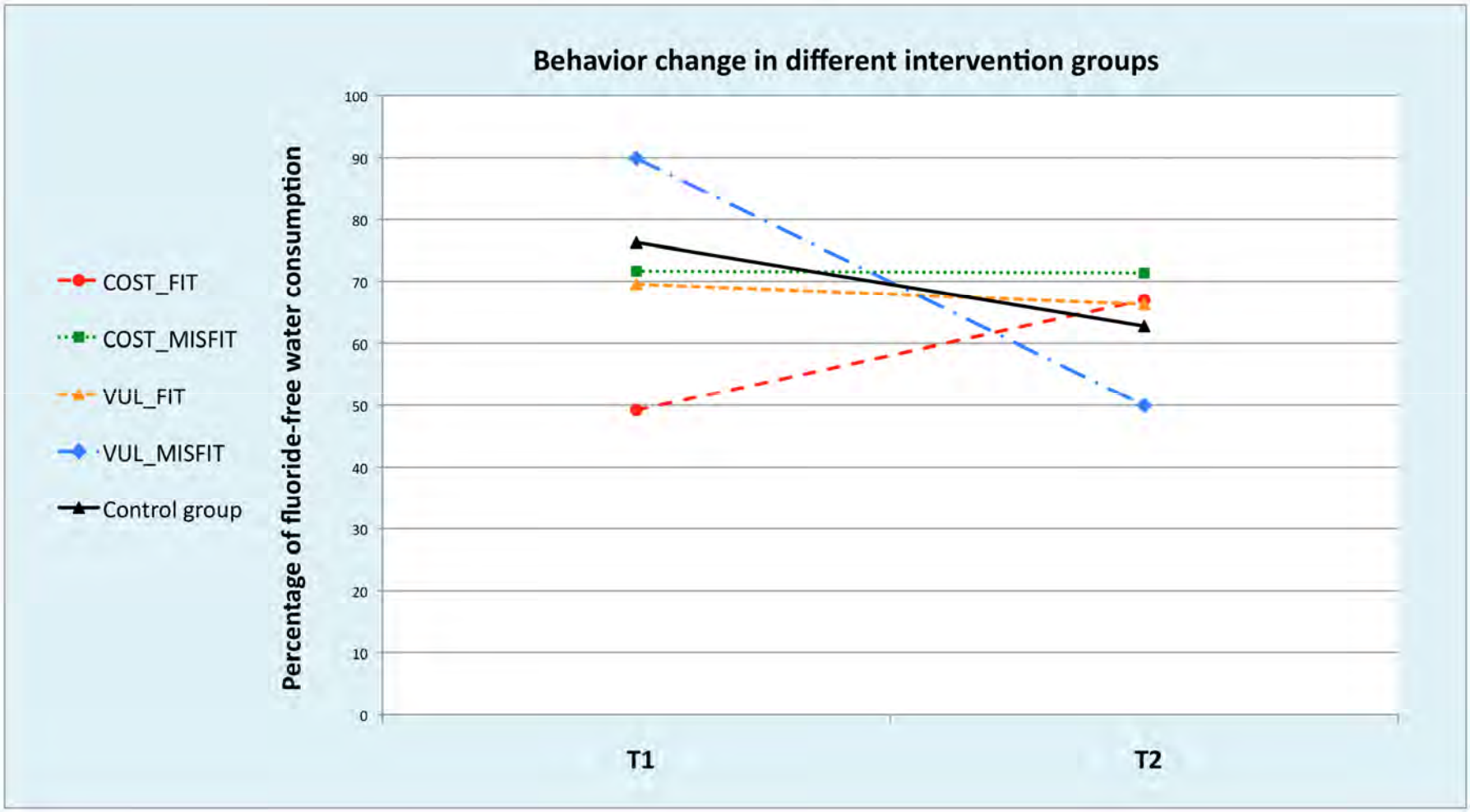
Field-experimental design



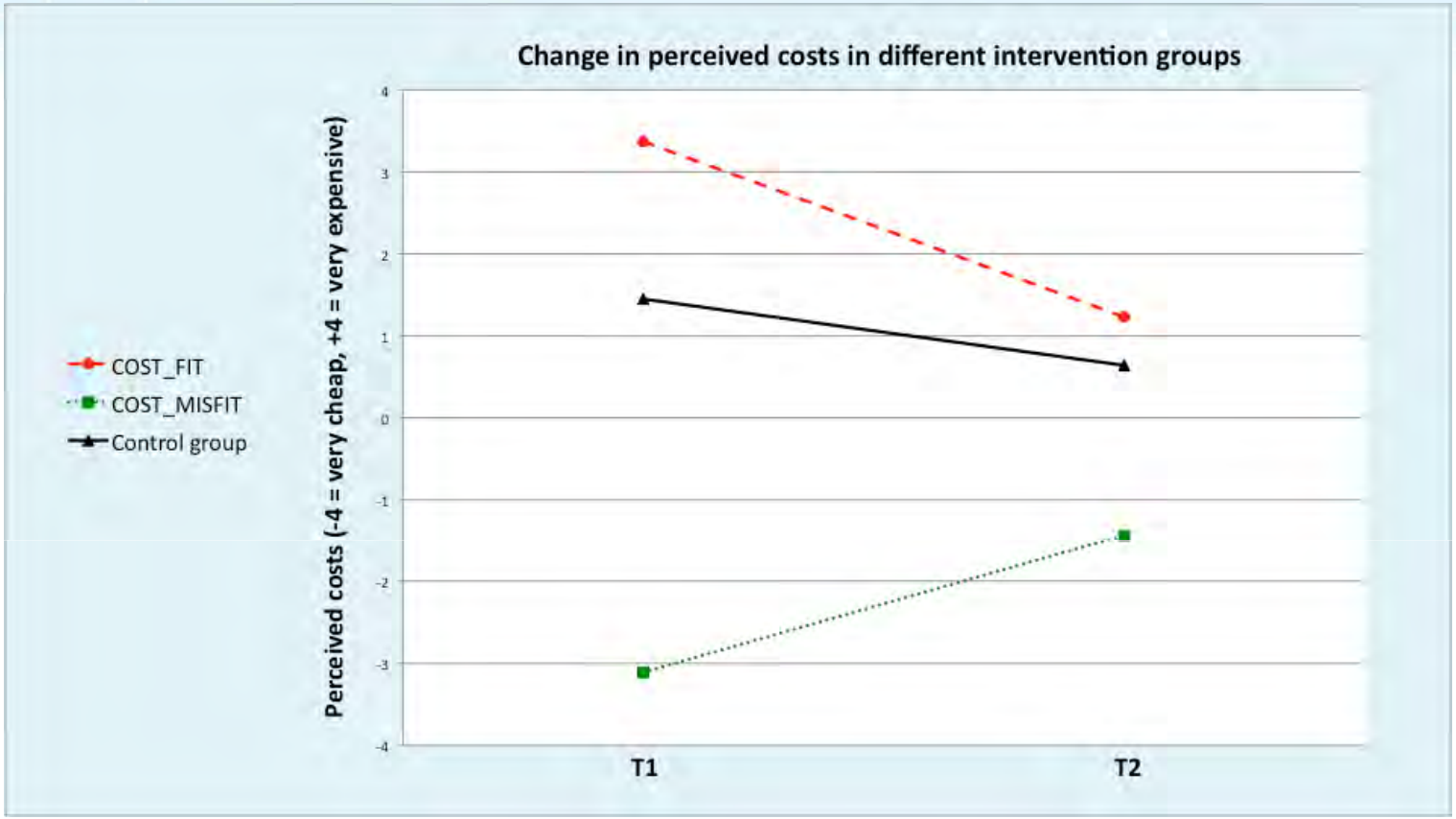
Evidence-based Behavior Change Protocol



Intervention effects: Behavior change

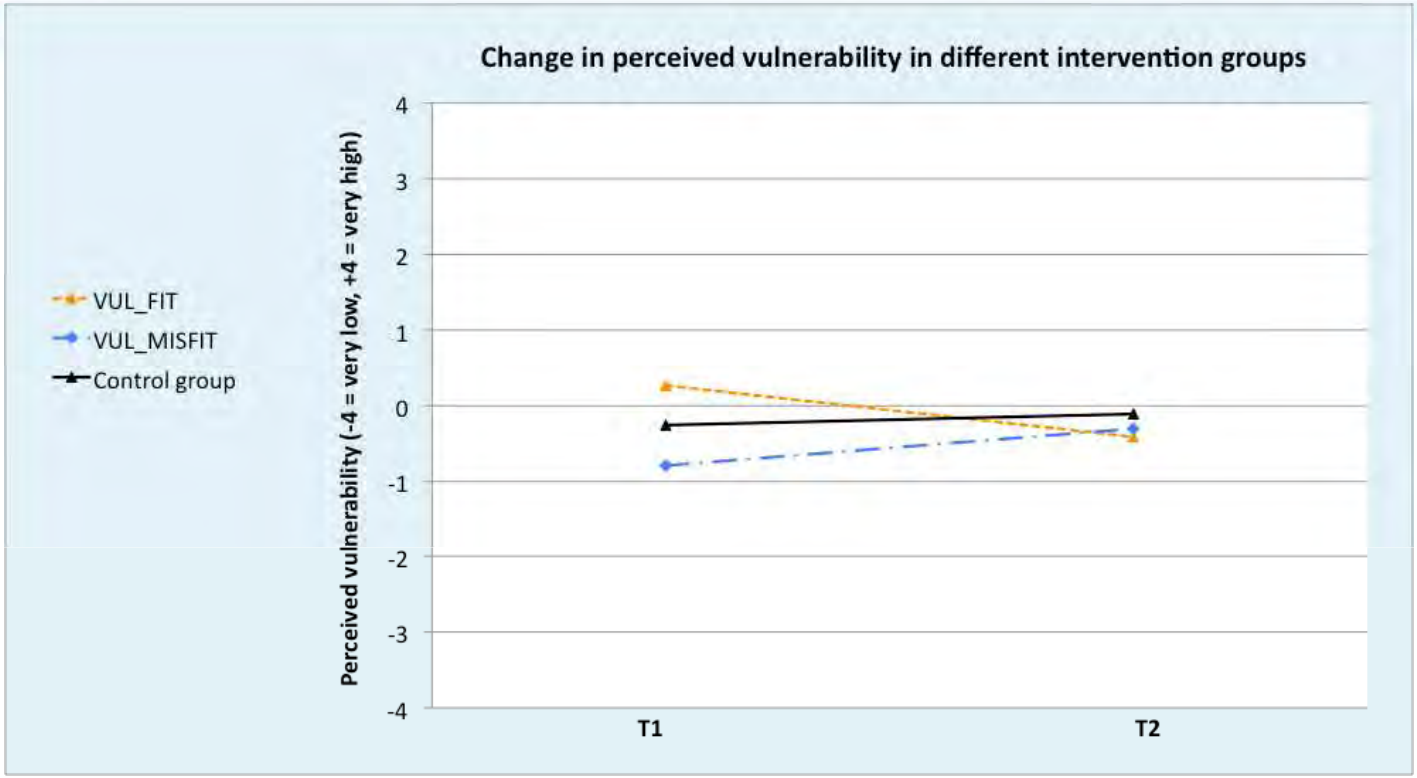


Intervention effects: Change of psychological variables



Compared groups		*M (SD)*	*M (SD)*	*U*	p^a	r^b
Group A	**Group B**	***Group A***	***Group B***			
COST_FIT	Control	-.267 (.31)	-.101 (.43)	953	.047*	.186
COST_MISFIT	Control	.21 (.37)	-.101 (.43)	528	.050	.203

Intervention effects: Change of psychological variables



Compared groups		*M (SD)*	*M (SD)*	*U*	p^a	r^b
Group A	**Group B**	*Group A*	*Group B*			
VUL_FIT	Control	-.17 (.55)	.037 (.46)	864	.108	-.153
VUL_MISFIT	Control	.121 (.29)	.037 (.46)	511	.568	.059

Example 2: Arsenicosis in Bangladesh

Risk perception information

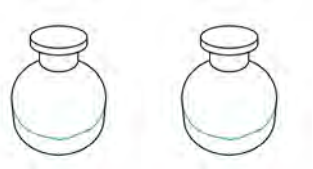
Prompt contaminated well

Implementation intention

Every day after / before 
(getting up / breakfast /.....)

and after / before  and after / before 

I am going to walk to *Mubarak*'s tubewell
(name of green tubewell owner)

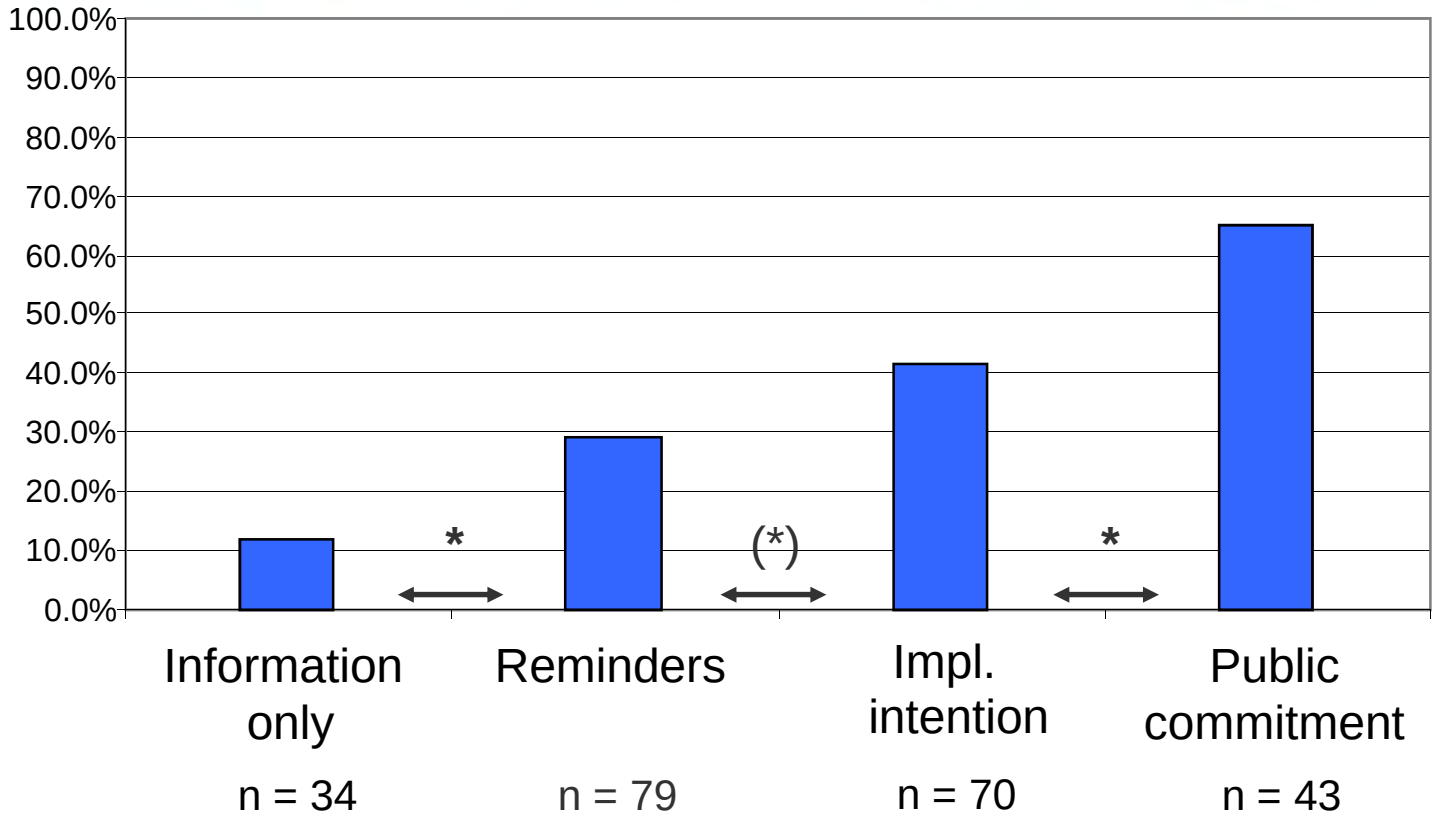
and I am going to collect 
(number of kolshi)

for  and  ".
(drinking / cooking / drinking and cooking)

Signature

Public commitment (Pledging)

Users of deep tubewells for drinking at T2 (number of households in %)



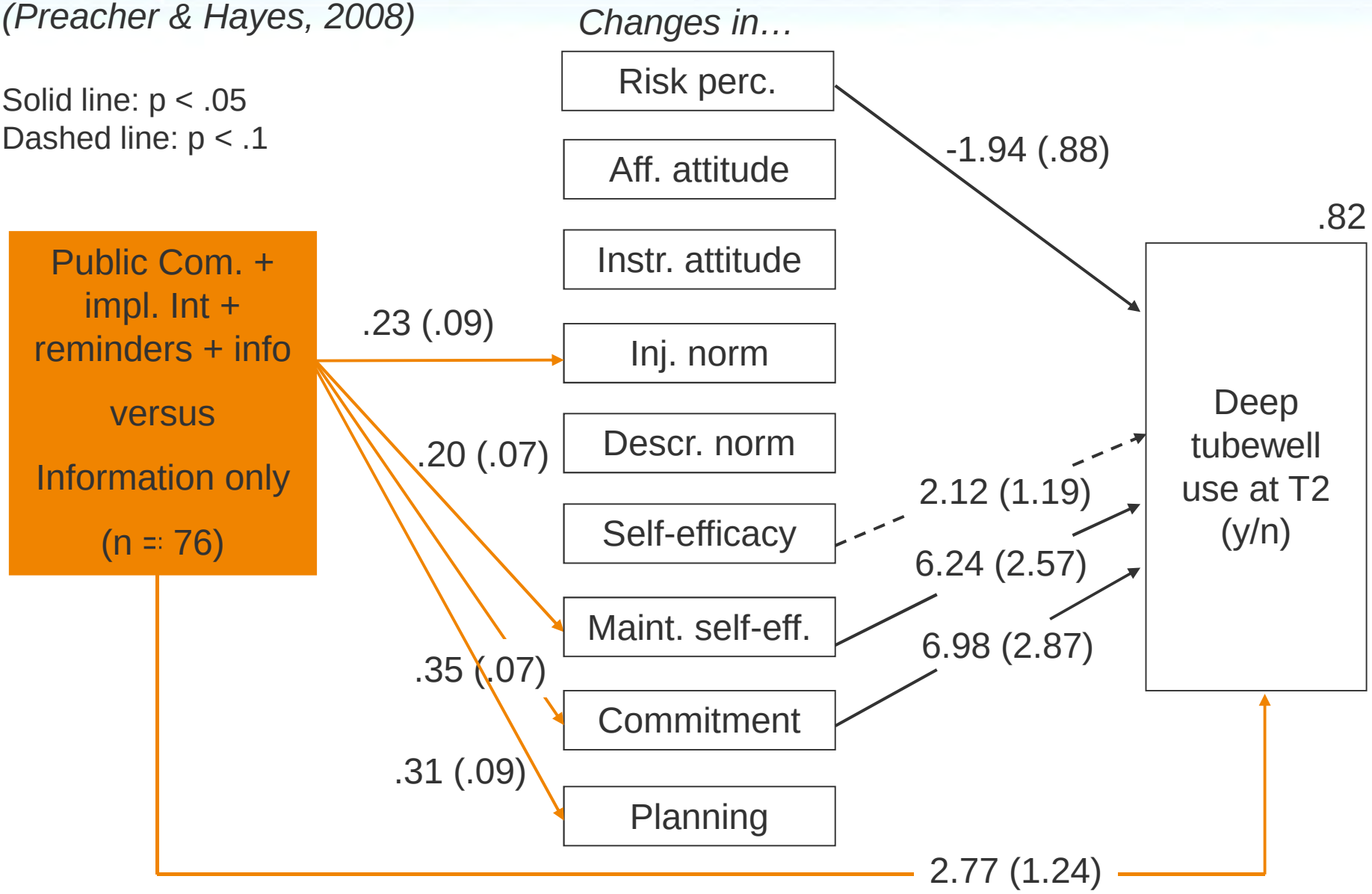
Note: at T1 all households were drinking arsenic-contaminated water

Mechanisms of behavior change

Multiple mediation analysis

(Preacher & Hayes, 2008)

Solid line: p < .05
Dashed line: p < .1



Weitere Beispiele aus dem Bereich Trinkwasser:

SODIS in Chuquisaca, Bolivien:
Population nutzt neu SODIS zu 60% (Abkochen bleibt bei ca. 30%)

SODIS in Harare, Zimbabwe:
100’000 Haushalte nutzen neu SODIS, zu 80% auch 1,5 Jahre nach Beginn der Interventionen

References:

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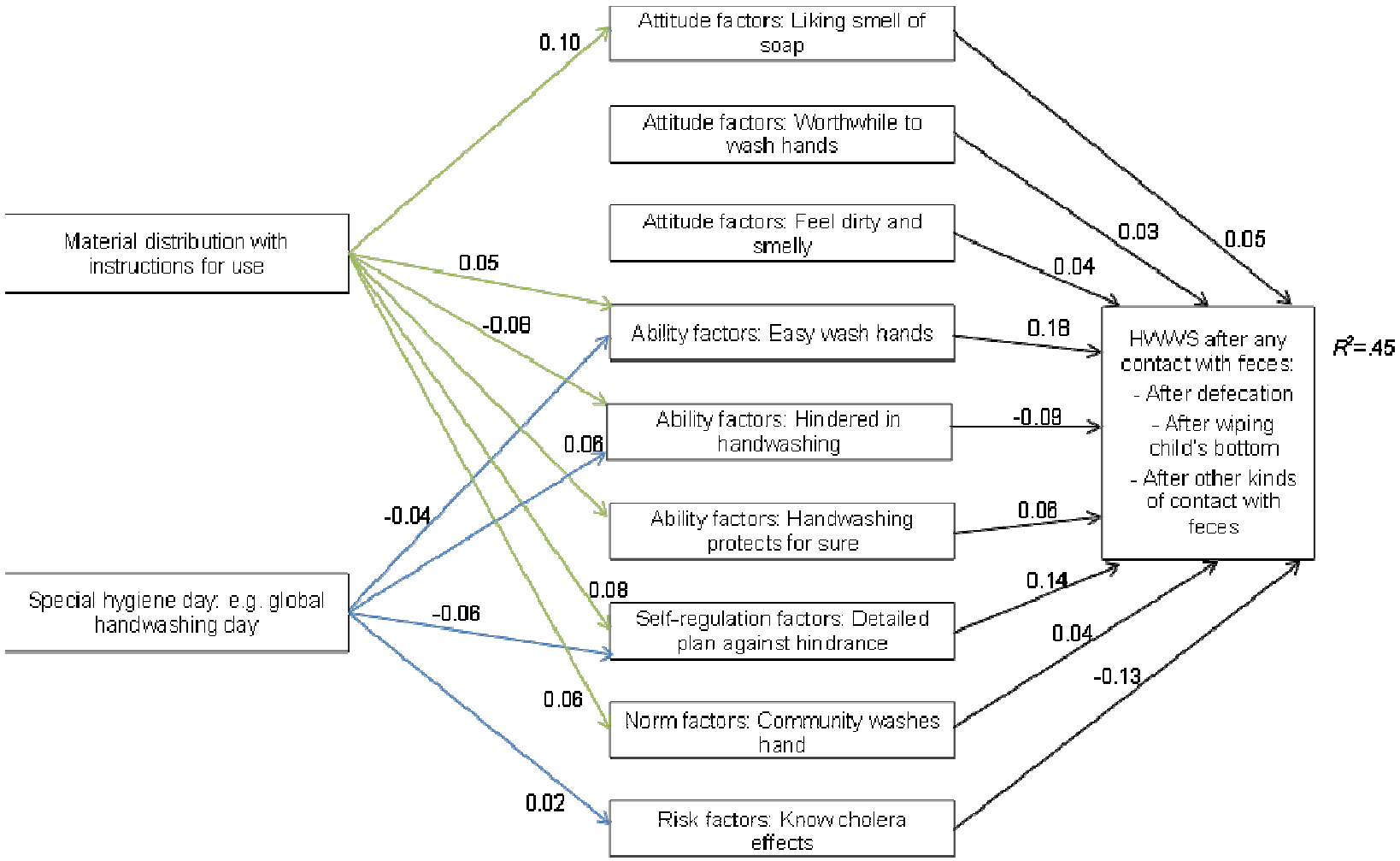
http://sozmod.eawag.ch/index.php

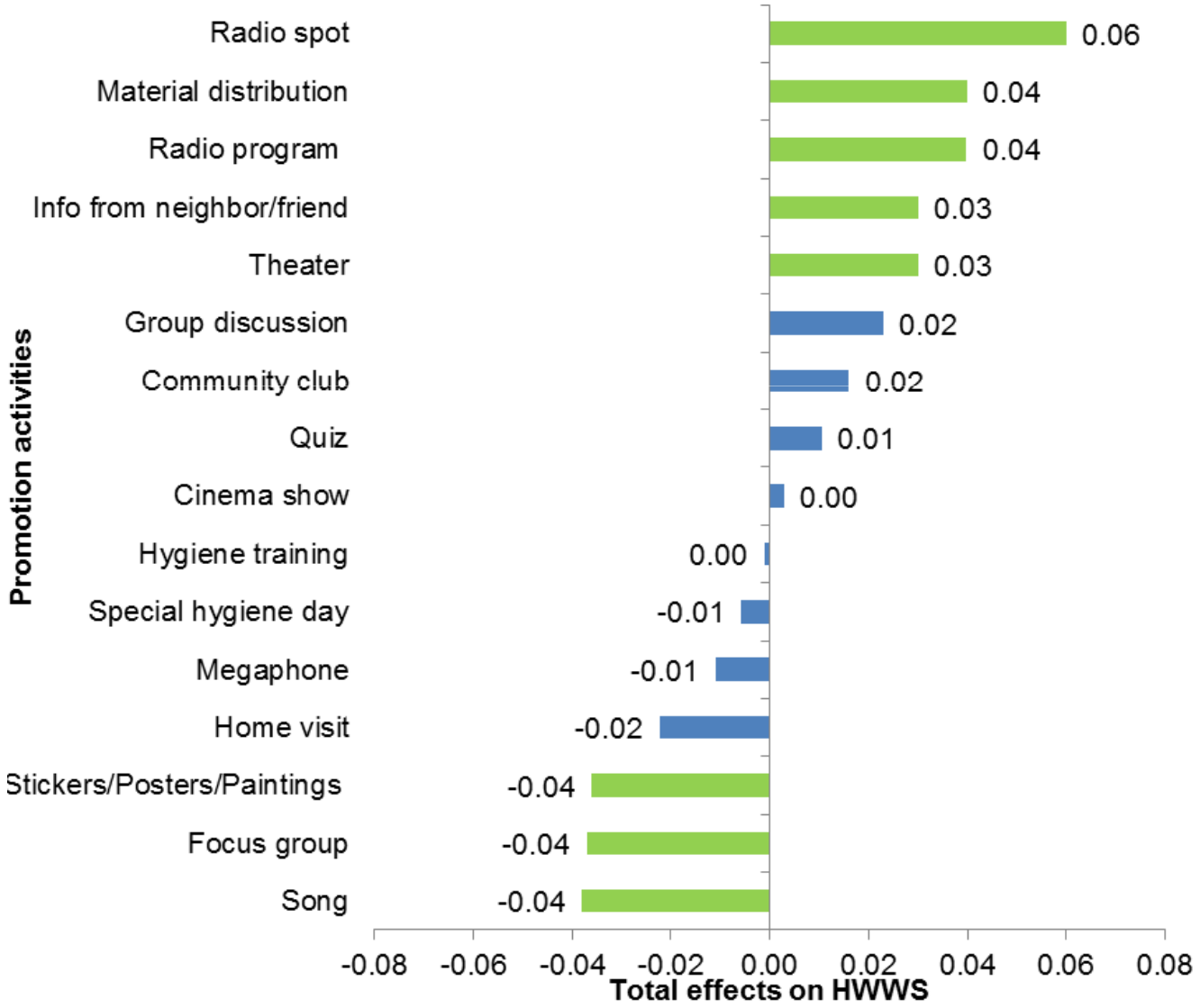
Hygiene: Haiti Hygiene Study with Oxfam America

Face-to-face interviews with 800 households on assessement and effects of promotion activities

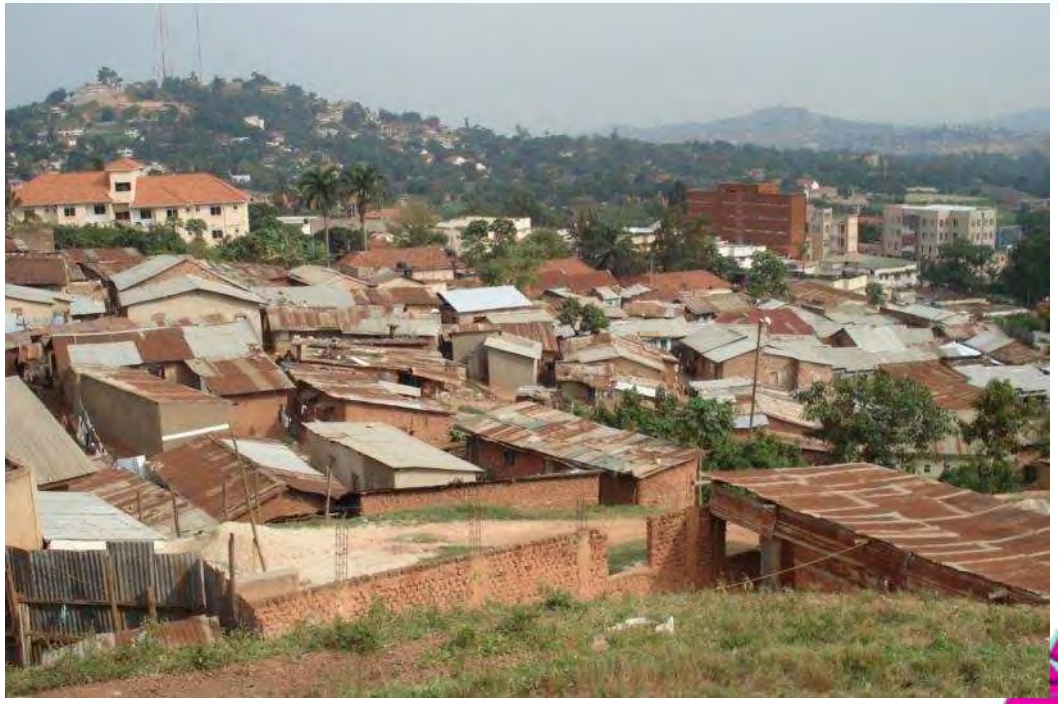
Example: Haiti Hygiene Study with Oxfam America



Example: Haiti Hygiene Study with Oxfam America



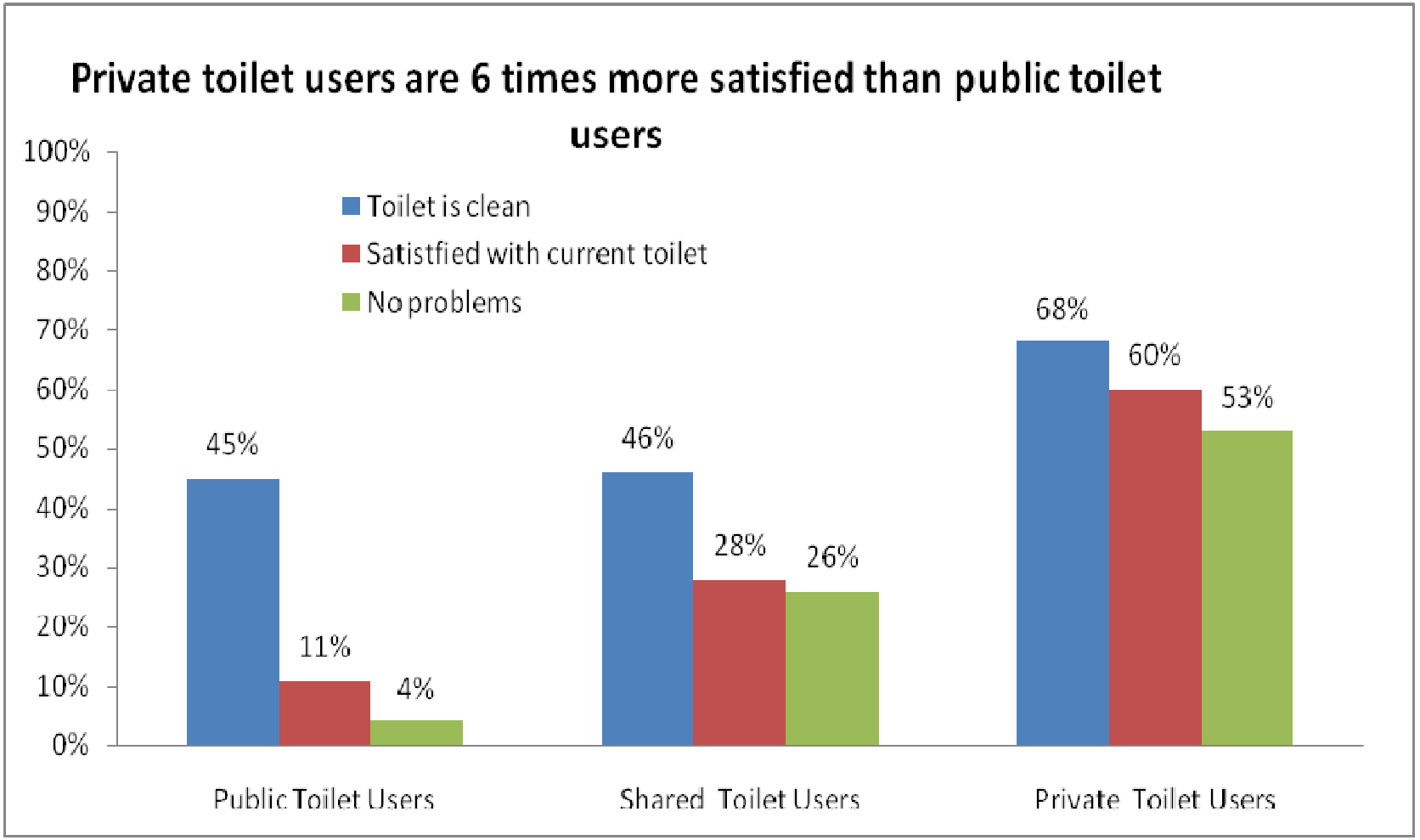
Example: Kampala Sanitation Study



Face-to-face interviews with 1500 households about the use of sanitation facilities

(see policy brief)

Example: Kampala Sanitation Study



Example: Kampala Sanitation Study

Results

1. 90% of the urban poor have access to an improved on-site sanitation facility
2. One pit has to be shared among 30 individuals
3. Private toilets is a privilege of house owners
4. 70% of Kampala's urban poor are tenants living in one room with 4 individuals
5. Only 50% of sanitation facilities are clean enough to be used properly → **Intervention on Cleaning**
6. 50% of sanitation facilities are abandoned after 5 years because of filling up or breaking down
7. The cost of an improved sanitation facility is equivalent to more than 1 year of per capita income

Summary

A sound psychologically based, quantitative assessment of behaviour determinants offers:

1. the targeted identification of the determinants that need to be changed
2. the selection of appropriate strategies and
3. the verifiable effective use of those.

Evidence based behaviour change programmes