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The Risks, Attitudes, Norms, Abilities, and Self-regulation (RANAS) approach to systematic behavior change

Nadja Contzen and Hans-Joachim Mosler

All behavior is based on processes in people's minds. Knowledge is activated, beliefs and emotions rise to the fore, and an intention to perform a particular behavior emerges, eventually resulting in observable behavior. In other words, these processes, which we term behavioral factors, determine behavior. To change behavior effectively, these behavioral factors have to be targeted by intervention programs. The Risks, Attitudes, Norms, Abilities, and Self-regulation (RANAS) approach to systematic behavior change is an established method for designing and evaluating behavior change strategies that target and change the behavioral factors of a specific behavior in a specific population. In brief, it is an easily applied method for measuring behavioral factors, assessing their influence on behavior, designing tailored strategies

that change behavior and measuring the effectiveness of these. Although it was originally developed to change behavior in the Water, Sanitation and Hygiene (WaSH) sector in developing countries, it is applicable to a range of behaviors in various settings and populations. The RANAS approach to systematic behavior change involves four steps (see figure): First, identify possible behavioral factors; second, measure the behavioral factors identified and determine those steering the behavior; third, select corresponding behavior change techniques (BCTs) and develop appropriate behavior change strategies; and fourth, implement and evaluate the behavior change strategies. In the following we briefly describe these four steps.
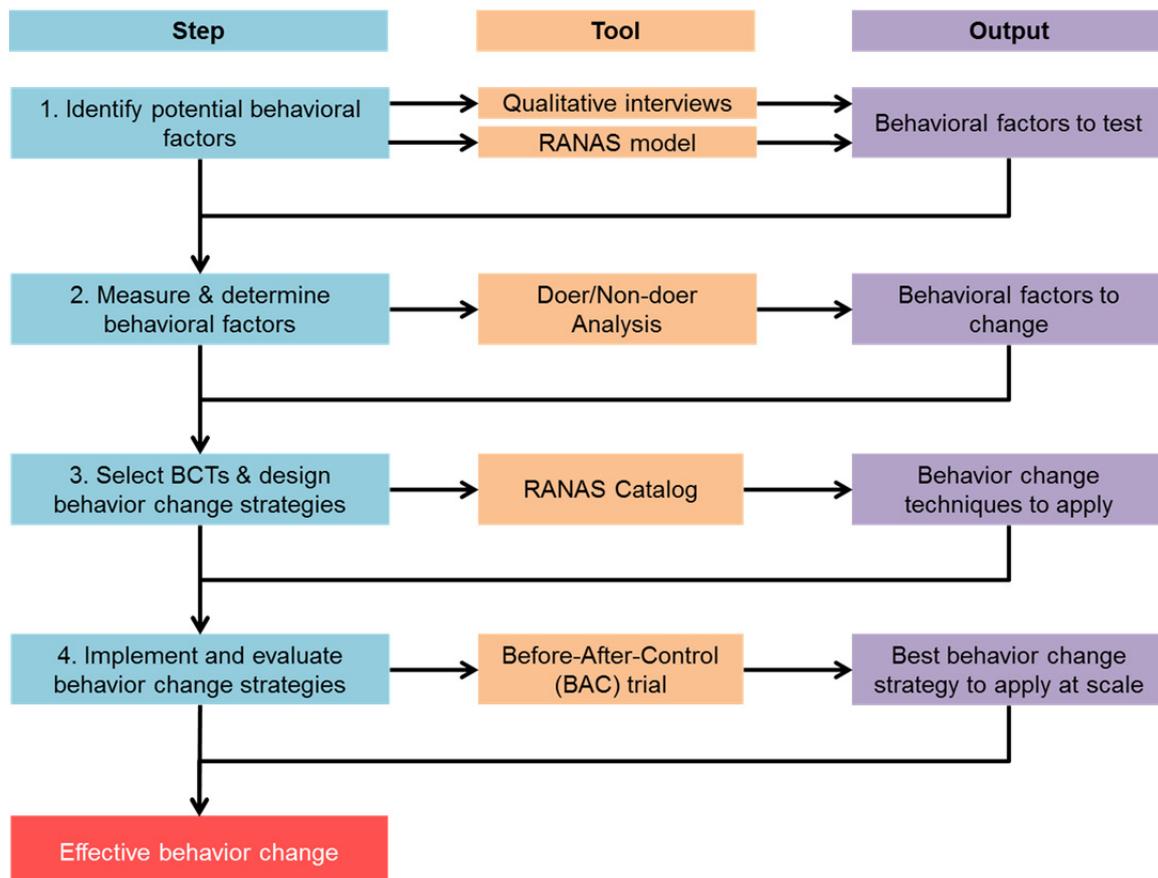

Figure: The four steps of the RANAS approach to systematic behavior change.

Step 1: Identify potential behavioral factors

First, the exact behavior to be changed and the specific population group to be targeted are defined; we specify who exactly should change which behavior. Then, we collect information on behavioral and contextual factors that might influence the target behavior, for example by conducting short qualitative interviews with various stakeholders at different levels, including the target population. Following this, the potential behavioral and contextual factors that we have identified are arranged in the RANAS model of behavior change, which may involve adapting and extending the model. The RANAS model integrates leading theories of behavior change and findings of environmental and health psychology and thus uses scientific expertise built on decades of research. By using the RANAS model to classify and organize the potential behavioral and context factors, we ensure that no important behavioral factors are neglected. For more information about the RANAS model, see Methodological Fact Sheet 2.

Step 2: Measure the identified potential factors and determine those steering the behavior

First, we develop a questionnaire to measure the behavior and the potential behavioral factors and a protocol to conduct observations of the target behavior. Template tools have been designed for both questionnaires and observation protocols, and these have to be adapted to the local conditions. A doer/non-doer analysis is conducted to identify the behavioral factors steering the target behavior. This means that the responses of people who do the behavior (doers) is are compared to the responses of those who do not (non-doers); a large difference in the responses between doers and non-doers shows that the behavioral factor in question critically steers the behavior and thus can be addressed through behavior change techniques (BCTs) to change the behavior.

Step 3: Select corresponding BCTs and develop appropriate behavior change strategies

The BCTs that are thought to change the critical behavioral factors specified in step 2 are selected for application in the behavior change strategies. A catalog of BCTs has been compiled to achieve this. The catalogue lists which BCTs are thought to change which behavioral factor, based on evidence from environmental and health psychology. The BCTs have to be adapted to the local context and combined with suitable communication channels, which constitute the mode of delivery of the BCTs. Together, the BCTs and the communication channels form a behavior change strategy.

Step 4: Implement and evaluate the behavior change strategies

To verify the efficacy of these behavior change strategies and to optimize them, the strategies are evaluated with a before-after control (BAC) trial. This means that the behavior and the potential behavioral factors are measured with a questionnaire and with observations both before (step 2) and after implementing the strategies. Further, a control group has to be evaluated. This is to control for intervention-independent changes in behavior.

The differences in behavior scores and in behavioral factor scores before and after the strategies' implementation are calculated and compared to those of the control group. The behavior change strategies have been effective when the before-after differences in behavior and behavioral factors are larger for the population that received the strategies than for the control group. The strategies can be refined if needed. Otherwise, they can be applied directly at larger scales or in other, similar areas, backed up by the evidence that they are effective in changing behavior.

Conclusion

Although the RANAS approach takes several months, it is worth applying; it results in behavior change strategies which (1) are tailored to the population, (2) have been proven to effectively change behavior under local conditions, and (3) thus provide an evidence base for further interventions. Not only has behavior been changed effectively but substantial arguments have been gained with which to attract support from local government and donors for future projects.

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The Risks, Attitudes, Norms, Abilities, and Self-regulation (RANAS) model of behavior change

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The core of the Risks, Attitudes, Norms, Abilities, and Self-regulation (RANAS) approach forms the RANAS model (see figure). The model has four components: behavioral factors that are grouped into five blocks, behavior change techniques (BCTs) that correspond to the factor blocks, behavioral outcomes, and contextual factors. This Fact Sheet outlines the factor blocks, the corresponding BCTs, the behavioral outcomes, and the contextual factors. More detailed descriptions of the behavioral factors and the BCTs are presented in Methodological Fact Sheets 3 and 4.

Behavioral outcomes

All the behavioral factors together determine the behavioral outcomes. The RANAS model considers three behavioral outcomes; behavior, intention, and habit. Behavior refers to the execution of actions. Both the desired behavior and competing behaviors must be considered—for example, not only drinking safe water (Behavior A) but also drinking untreated water (Behavior B). In the water and sanitation sector, the behavior of interest often constitutes the use of a technology, such as a water source or sanitation facility. Intention represents a person's readiness to practice a behavior: how willing the person is to implement a behavior. Habits are routinized behaviors that are executed in specific, repeating situations nearly automatically and without any cognitive effort. In the table below are some example questions to measure the behavioral outcomes.
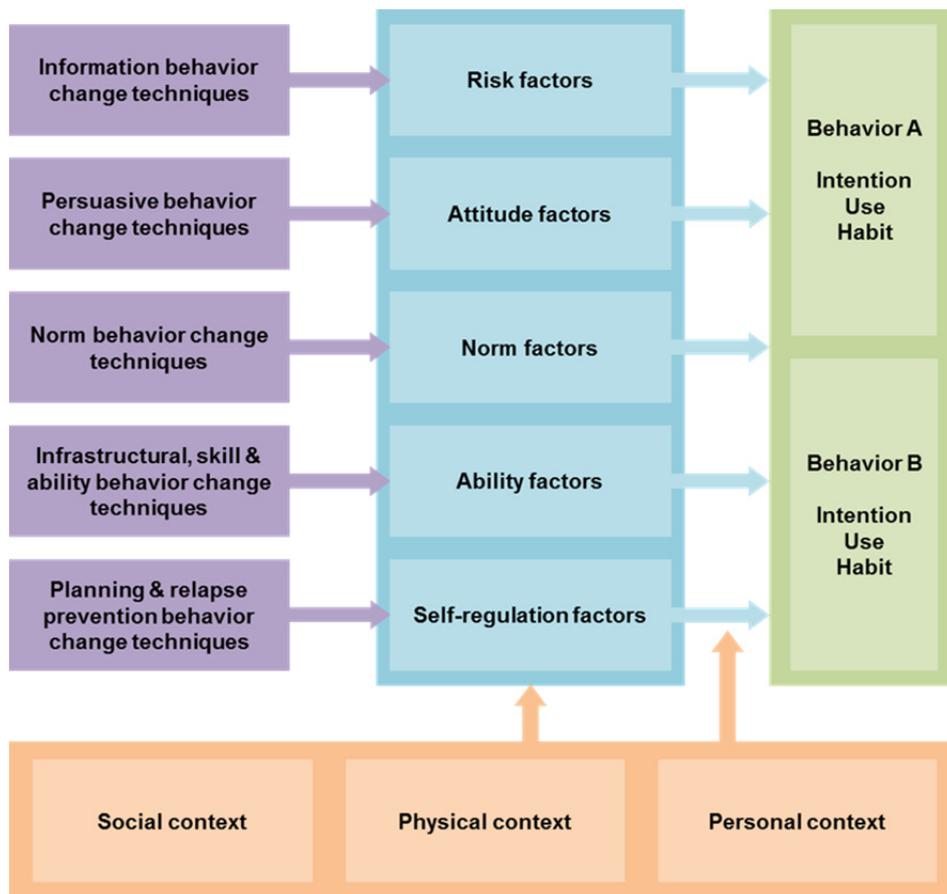

Figure: The RANAS model of behavior change.

Contextual factors

Behavior and the behavioral factors that give rise to it are embedded in contextual factors. According to the RANAS model, the contextual factors can influence behavior in two ways. First, they can affect behavior by changing the behavioral factors. For example, a person with low income might evaluate the cost of soap for handwashing as higher than a person with high income. Second, they may alter the behavioral factors' influence on behavior; for instance, a person might be strongly committed to collecting safe water, but the commitment may not translate into behavior due to a lack of access to a safe water source. The contextual factors can be divided into three categories: the social, the physical, and the personal. The social context is constituted by culture and social relations, laws and policies, economic conditions, and the information environment. The physical context consists of the natural and built environment. Finally, the personal context is formed by socio-demographic factors such as age, sex, and education and by the physical and mental health of the person.

Table: Example questions to measure behavioral outcomes		
Behavioral outcome	**Example question**	**Response scale**
Behavior (frequency)	How much of your household's drinking water is treated?	0 = Almost none; 1 = Less than half; 2 = About half; 3 = More than half; 4 = Almost all
Intention	How strongly do you intend to treat all your drinking water?	0 = Not strongly; 1 = A little strongly; 2 = Strongly; 3 = Quite strongly; 4 = Very strongly
Habit (automaticity)	How much do you feel that you treat your drinking water automatically?	0 = Not automatically; 1 = A little automatically; 2 = Automatically; 3 = Quite automatically; 4 = Very automatically

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The Risks, Attitudes, Norms, Abilities, and Self-regulation (RANAS) behavioral factors

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Behavioral factors are perceptions, thoughts, feelings, and beliefs which influence the practice of a behavior. Together, they characterize the mindset of a person with regard to that behavior. Different behavioral factors will most critically regulate different behaviors in different populations and contexts. To select the most effective behavior change techniques, we recommend surveying all the potential behavioral factors and conducting a doer-non-doer analysis to specify which behavioral factors are most critical. These are the factors to be addressed through behavior change techniques. Here, we first define all potential behavioral factors and then present example questions for each factor for chlorinating drinking water.

Table 1: Definitions of behavioral factors (continued on next page)	
Behavioral factor	**Definition**
Risk factors: represent a person's understanding and awareness of the health risk.	
Health knowledge	A person's knowledge about a disease's causes and (personal) consequences and its preventive measures.
Vulnerability	A person's estimate about the general probability to contract a disease and the subjective awareness of the personal risk of contraction.
Severity	A person's assessment of the seriousness of an infection and of the significance of the disease's consequences.
Attitude factors: represent a person's positive or negative stance towards a behavior.	
Beliefs about costs and benefits	A person's beliefs about monetary and non-monetary costs (time, effort etc.) and benefits (lower medical costs, improved health) of a behavior, including social benefits (higher status, appreciation by others).
Feelings	A person's emotions (joy, pride, disgust etc.) which arise when thinking of a behavior or its consequences or when practicing the behavior.
Norm factors: represent the perceived social pressure towards a behavior.	
Others' behavior	A person's observation and awareness of others' behavior, his or her perceptions as to which behaviors are typically practiced by others.
Others' (dis)approval	A person's perceptions as to which behaviors are typically approved or disapproved by relatives, friends, or neighbors. This includes the awareness of institutional norms, i.e. the dos and don'ts expressed by recognized authorities such as village, tribe, or religious leaders, and other institutions.
Personal importance	A person's beliefs about what she or he should do or should not do.
Ability factors: represent a person's confidence in her or his ability to practice a behavior.	
How-to-do knowledge	A person's knowledge of how to execute the behavior
Confidence in performance	A person's perceived ability to organize and execute the courses of action required to practice a behavior.
Confidence in continuation	A person's perceived ability to continue to practice a behavior which includes the person's confidence in being able to deal with barriers that arise.
Confidence in recovering	A person's perceived ability to recover from setbacks, to continue the behavior after disruptions.

Table 1: Definitions of behavioral factors (continued)

Behavioral factor	Definition
Self-regulation factors: represent a person's attempts to plan and self-monitor a behavior and to manage conflicting goals and distracting cues.	
Action planning	The extent of a person's attempts to plan a behavior's execution, including the when, where, and how of the behavior.
Action control	The extent of a person's attempts to self-monitor a behavior by continuously evaluating and correcting the ongoing behavior toward a behavioral goal.
Barrier planning	The extent of a person's attempts to plan to overcome barriers which would impede the behavior.
Remembering	A person's perceived ease of remembering to practice the new behavior in key situations.
Commitment	The obligation a person feels to practice a behavior.

Table 2: Example questions to measure behavioral factors (continued on next page)

Behavioral factor	Question example	Response scale
Health knowledge	I will present you some potential causes of diarrhea. Could you please tell me for each whether it is a cause or not? 1. Water contaminated by bacteria 2. Mosquito bite 3. Spicy food 4. Raw water	A = Yes; B = No. Each correct answer is awarded with one point.
Vulnerability	How high do you feel is the risk that you contract diarrhea?	0 = No risk; 1 = A little risk; 2 = A risk; 3 = Quite a risk; 4 = A high risk
Severity	Imagine you contracted diarrhea, how severe would be the impact on your daily life?	0 = Not severe; 1 = A little severe; 2 = Severe; 3 = Quite severe; 4 = Very severe
Beliefs about costs and benefits (effort)	How effortful do you think is it to chlorinate all your drinking water?	0 = Not effortful; 1 = A little effortful; 2 = Effortful; 3 = Quite effortful; 4 = Very effortful
Beliefs about costs and benefits (time)	How time-consuming do you think is it to chlorinate all your drinking water?	0 = Not time-consuming; 1 = A little time-consuming; 2 = Time-consuming; 3 = Quite time-consuming; 4 = Very time-consuming
Beliefs about costs and benefits (health)	How certain are you that chlorinating all your drinking water prevents you from getting diarrhea?	0 = Not certain; 1 = A little certain; 2 = Certain; 3 = Quite certain; 4 = Very certain
Feelings (behavior)	How much do you like to chlorinate all your drinking water?	0 = Don't like it; 1 = Like it a little; 2 = Like it; 3 = Quite like it; 4 = Like it a lot
Feelings (taste)	How much do you like the taste of chlorinated water?	0 = Don't like it; 1 = Like it a little; 2 = Like it; 3 = Quite like it; 4 = Like it a lot
Others' behavior	How many people in your community chlorinate all their drinking water?	0 = (Almost) nobody; 1 = Some of them; 2 = Half of them; 3 = Most of them; 4 = (Almost) all of them
Others' (dis)approval	People who are important to you, how much do they approve to chlorinate all drinking water?	0 = Disapprove a lot; 1 = Disapprove; 2 = Neither approve nor disapprove; 3 = Approve; 4 = Approve a lot
Personal importance	How strongly do you feel an obligation to yourself to chlorinate all your drinking water?	0 = Not obliged; 1 = A little obliged; 2 = Obliged; 3 = Quite obliged; 4 = Very obliged

Table 2: Example questions to measure behavioral factors (continued)

Behavioral factor	Question example	Response scale
How-to-do knowledge	How are 20 Liters of drinking water correctly chlorinated?	No answer options are provided. Each mentioned critical step of chlorination is awarded with one point: A = Filter turbid water; B = Add [2 caps] of chlorine to the water; C = Wait for [30] minutes; D = For turbid water, add [two caps] of chlorine to the water. Note: correct amount of chlorine and time depends on used product.
Confidence in performance	How confident are you that you can chlorinate your drinking water?	0 = Not confident; 1 = A little confident; 2 = Confident; 3 = Quite confident; 4 = Very confident
Confidence in continuation	How confident are you that you can continuously chlorinate all your drinking water even though you have to spend a substantial amount of money on chlorine?	0 = Not confident; 1 = A little confident; 2 = Confident; 3 = Quite confident; 4 = Very confident
Confidence in recovering	Imagine you have stopped chlorinating your drinking water for several days, for example because there was no chlorine available. How confident are you that you would start chlorinating all your drinking water again?	0 = Not confident; 1 = A little confident; 2 = Confident; 3 = Quite confident; 4 = Very confident
Action planning	Do you have a plan when during the course of your day to chlorinate your drinking water? *If yes:* Could you please specify the point in time?	No answer options are provided. Answers will be classified into "specific plans" (e.g. after breakfast; at 9am) and "unspecific/no plans" (e.g. in the morning).
Action control	How much do you pay attention to chlorinating all your drinking water?	0 = Pay no attention; 1 = Pay a little attention; 2 = Pay attention; 3 = Quite pay attention; 4 = Pay much attention
Barrier planning	Do you have a plan how you can treat all your drinking water even if there is no chlorine at home?	No answer options are provided. Answers will be classified into "correct plan" (e.g. I'll boil the water) and "incorrect/no plan" (e.g. I'll drink raw water).
Remembering/ forgetting	How often does it happen that you forget to chlorinate your drinking water?	0 = (Almost) never (0%); 1 = Seldom (25%); 2 = Sometimes (50%); 3 = Often (75%); 4 = (Almost) always (100%)
Commitment	How important is it for you to chlorinate all your drinking water?	0 = Not important; 1 = A little important; 2 = Important; 3 = Quite important; 4 = Very important

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The RANAS (Risks, Attitudes, Norms, Abilities, and Self-regulation) behavior change techniques (BCTs)

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Behavior change techniques (BCTs) the components of an intervention strategy designed to alter or redirect the processes that regulate behavior. BCTs are observable, replicable, and irreducible, meaning that they cannot be divided into smaller sub-elements. Several BCTs can be combined, and they are brought to recipients through one or several communication channels, thus forming intervention strategies. BCTs are the what of an intervention strategy, whereas the communication channels are the how. To be most effective, BCTs should correspond with the behavioral factors that were found to differ between doers and non-doers. While many of the BCTs address more than one behavioral factor, all but one have a predominant behavioral factor on which they operate (see the main behavioral factor listed in the left-hand column below). The exception is exploit persuasive attributes, which means using the persuasive attributes of the information/testimonial source and of the message. Persuasive attributes include the competence, sympathy, credibility, famousness, and publicity of the source and the length and number of arguments of the message. As every BCT implies a specific source from which a specific message is sent, exploit persuasive attributes can be applied in combination with every other BCT so as to increase impact. Each BCT is briefly described here.

Table: Behavioral factors and behavior change techniques (continued on next page)	
Behavioral factors	**Behavior change techniques**
Information BCTs – Risk factors	
Health knowledge	1. **Present facts**: present information about the circumstances and possibilities of contracting a disease and about the relationship between a behavior and the disease.
	2. **Present scenarios**: present situations in the everyday life of the participant, showing how a certain behavior leads to the disease.
Vulnerability	3. **Inform about and assess personal risk**: present qualitative and quantitative assessments individually for each person in such a way that the person realizes that his/her health is at risk.
Severity	4. **Arouse fear**: use threatening information that stresses the severity of contracting a disease.
Persuasive BCTs – Attitude factors	
Beliefs about costs and benefits	5. **Inform about and assess costs and benefits:** provide information about costs and benefits of a behavior (omission) and conduct a cost-benefit analysis.
	6. **Use subsequent reward:** reward the person each time she/he has performed the desired behavior or achieved the behavioral outcome.
	7. **Prompt to talk to others:** invite participants to talk to others about the healthy behavior in question.
Feelings	8. **Describe feelings about performing and about consequences of the behavior:** present the performance and the consequences of a healthy behavior as pleasant and joyful and its omission or an unhealthy behavior as unpleasant and aversive.
Norm BCTs – Norm factors	
Others' behavior	9. **Inform about others' behavior:** point out that a desired behavior is already adapted by other persons.
	10. **Prompt public commitment:** let people commit to a favorable behavior and make their commitment public, thus showing to others that there are people who perform the behavior.

Table: Behavioral factors and behavior change techniques (continued)	
Behavioral factors	**Behavior change techniques**
Others' (dis)approval	11. **Inform about others' approval / disapproval:** point out that important others support the desired behavior or disapprove the unhealthy behavior.
Personal importance	12. **Prompt anticipated regret:** bring people to imagine the concerns and regret they would feel after performing undesired behaviors which are not consistent with their personal norms of living healthily and caring for their children.
	13. **Provide a positive group identity:** describe people already engaged in the behavior in an attractive way, for example as modern and up-to-date so as to increase the attractiveness of the behavior itself.
	14. **Prompt identification as role model:** ask participants to set a good example (e.g. for children) by engaging in the desired behavior so as to influence others' behaviors by one's own behavior.
Infrastructural, skill and ability BCTs – Ability factors	
How-to-do knowledge	15. **Provide instruction:** convey know-how in order to improve a person's knowledge about how to perform the respective behavior.
Confidence in performance	16. **Provide infrastructure:** prompt and support the community or households to set up infrastructure.
	17. **Demonstrate and model behavior:** demonstrate a behavior and prompt participants to pay attention to others' performing the behavior and its consequences in their everyday life.
	18. **Prompt guided practice:** train participants in behavior enactment by giving instructions, demonstrating the behavior, letting him/her practice and giving feedback about the correctness of the performance.
	19. **Prompt behavioral practice:** prompt participants to practice the new behavior in their daily life.
	20. **Facilitate resources:** provide financial help. It may be unconditional or conditional, meaning the recipient has to contribute (e.g. with manpower) to get the resources.
	21. **Organize social support:** prompt participants to seek practical or emotional support from neighbors, friends, acquaintances, or relatives and/or to initiate social support groups.
	22. **Use arguments to bolster self-efficacy:** convince participants that they will be able to perform and/or maintain the desired behavior.
	23. **Set graded tasks/goals:** prompt participants to learn difficult behaviors including several tasks step by step.
Confidence in continuation	24. **Reattribute past successes and failures:** prompt participants to attribute failures to a temporary lack of skill or adverse circumstances instead of to his/her deficiency and successes as personal achievements.
Confidence in recovering	25. **Prompt coping with relapse:** tell participants that lapses are normal when adopting a new behavior and, though discouraging, not a sign of failure.
Planning & relapse prevention BCTs – Self-regulation factors	
Action planning	26. **Prompt specific planning:** stimulate participants not only to formulate what she/he will do, but also when, where, and how she/he intends to achieve his or her goals.
Action control	27. **Prompt (self)-monitoring of behavior:** invite participants to (self-)monitor their behavior by means of recording it (e.g. frequency).
	28. **Provide feedback on performance:** give participants a feedback on their behavior performance.
	29. **Highlight discrepancy between set goal and actual behavior:** invite the participant to regularly evaluate the actual behavior performance (e.g. correctness, frequency and duration) in relation to the set behavioral goal.

Table: Behavioral factors and behavior change techniques (continued)	
Behavioral factors	**Behavior change techniques**
Barrier planning	30. **Prompt coping with barriers:** ask participants to identify barriers to behavior change and plan solutions to those barriers.
	31. **Restructure the social and physical environment:** prompt participants to remove social and physical bolsters of the undesired behavior so as to interrupt habitual procedures.
	32. **Prompt to resist social pressure:** ask participants to anticipate and prepare for negative comments from others or for pressures towards the undesired behavior.
	33. **Provide negotiation skills:** prompt participants to reflect on others' perspectives to find compromises that benefit both sides and arguments bolstering them.
Remembering	34. **Use memory aids and environmental prompts:** prompt the participant to install memory aids or to exploit environmental cues so as to help to remember the new behavior and to trigger it in the right situation.
Commitment	35. **Prompt goal setting:** invite participants to formulate a behavioral goal or intention.
	36. **Prompt to agree on a behavioral contract:** invite the participant to agree to a behavioral contract to strengthen her/his commitment to a set goal.

Further information
http://www.eawag.ch/en/department/ess/main-focus/environmental-and-health-psychology-ehpsy

Publications
Mosler, H-J. (2012). A systematic approach to behavior change interventions for the water and sanitation sector in developing countries: a conceptual model, a review, and a guideline. *International Journal of Environmental Health Research, 22,* 431-449.

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Doer/non-doer analysis to specify the critical behavioral factors

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Doer/non-doer analysis is a method of identifying the factors that critically steer the target behavior. These have to be tackled by behavior change techniques (BCTs) to induce behavior change. A doer/non-doer analysis compares the responses of people who do a behavior (doers) to the responses of those who do not (non-doers). A large difference between doers and non-doers in responses to a question about a behavioral factor indicates that that factor is critical. A doer/non-doer analysis involves three steps. First, the sample is divided into doers and non-doers. Second, mean scores are calculated separately for doers and non-doers. Third, the mean scores are compared between doers and non-doers. The three steps are explained in more detail here.

Divide the sample into doers and non-doers

For most behaviors, there is no predefined value to divide the sample into doers and non-doers. Instead, a cut-off point has to be determined based on the data. For handwashing, for example, we could decide to categorize only people who fully comply (100% handwashing at key times) as doers and all who wash their hands less than 100% of key times as non-doers. However, such a division might be too strict and unrealistic in many populations. Therefore, a more reasonable cut-off point might be 90% handwashing at key times. In this case, people who wash hands at 90% of key times and more are doers; people who wash hands at less than 90% are non-doers. When we have defined a cut-off point, we divide the sample into doers and non-doers.

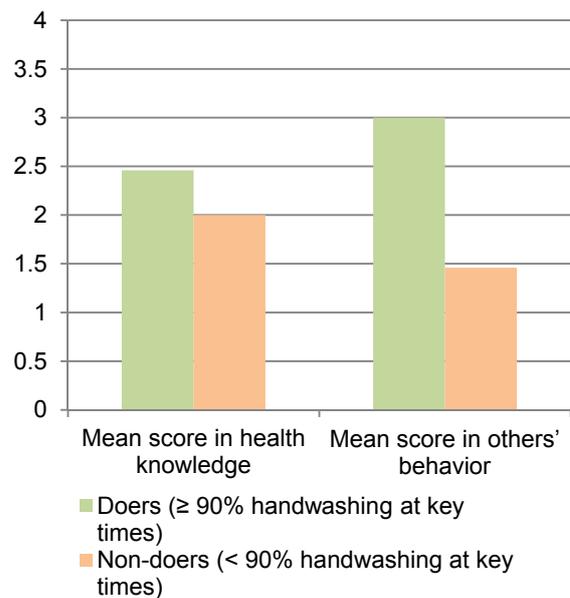## Calculate the mean scores of each behavioral factor separately for doers and non-doers

For each behavioral factor (i.e. for each question), the mean score in the responses is calculated separately for doers and non-doers. Below you find a fictional example for the behavioral factors *health knowledge and others' behavior.*

Table: Example of a doer/non-doer comparison					
Doers **90% or more handwashing at key times**			**Non-doers** **Less than 90% handwashing at key times**		
Person	**Score in health knowledge**	**Score in others' behavior**	**Person**	**Score in health knowledge**	**Score in others' behavior**
A	2	4	B	4	4
D	3	3	C	2	0
F	4	4	E	2	1
H	2	2	G	1	1
I	1	1	K	3	2
J	3	4	M	2	2
L	3	4	N	3	2
P	3	3	O	1	1
R	0	0	Q	0	0
S	4	4	T	1	0
U	3	3	X	1	1
V	2	4	Y	2	2
W	2	3	Z	4	3
Mean score	**2.46**	**3.00**	**Mean score**	**2.00**	**1.46**

Compare the mean scores between doers and non-doers

Next, we compare the mean scores of doers and non-doers for each behavioral factor. We can do this in two ways. Either we can calculate the differences in mean scores between doers and non-doers or we can plot graphs depicting the mean scores of doers and non-doers per behavioral factor. In either case, the critical behavioral factors are those with the largest differences between doers and non-doers. For the example above, the difference between doers and non-doers in health knowledge is $2.46 - 2 = 0.46$; the difference in others' behavior is $3.00 - 1.46 = 1.54$. As the difference in mean scores between doers and non-doers is larger for others' behavior (1.54) than for health knowledge (0.46), others' behavior is more critical. We draw the same conclusion when depicting the differences between doers and non-doers through a graph (see Figure). Therefore, others' behavior should be targeted through BCTs.

Figure: Graph comparing doers and non-doers.

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Comparing the Risks, Attitudes, Norms, Abilities, and Self-regulation (RANAS) approach to systematic behavior change with Knowledge, Attitudes and Practice (KAP) surveys

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Most behavior change interventions in the Water, Sanitation and Hygiene (WaSH) sector are preceded and followed by a Knowledge, Attitudes and Practice (KAP) survey to inform and evaluate the interventions. While there are similarities between KAP surveys and the Risks, Attitudes, Norms, Abilities, and Self-regulation (RANAS) approach, the two approaches differ in several crucial aspects.

Table: Comparison of KAP surveys and the RANAS approach		
KAP surveys	**RANAS approach**	**Advantage of the RANAS approach**
Limited scope of potential behavioral factors: • Knowledge • Attitudes	Broad scope of potential behavioral factors: • Risk factors (knowledge) • Attitude factors • Norm factors • Ability factors • Self-regulation factors	Scope is in line with the existing scientific evidence that has proven that knowledge and attitudes are neither the only nor the most important determinants of behavior.
Different surveys do not define knowledge, attitudes, and practice consistently. Therefore survey questions, even for the same behavior and population, vary significantly.	Risk, attitudinal, norm, ability and self-regulation factors and behavioral outcomes have been precisely defined. This allows the consistent formulation of survey questions. Cf. Methodological Fact Sheet 3.	Consistent survey questions maximize the comparability between surveys.
Data analysis is limited to calculating frequencies or mean values of knowledge, attitudes and practice in a target population.	Data analysis is based on doer/non-doer analysis comparing the frequencies or mean values in potential behavioral factors between doers and non-doers in a target population. Cf. Methodological Fact Sheet 5.	Doer/non-doer analyses allow determining the behavior steering factors in a target population. These are the factors to be tackled within interventions.
Do not imply a method to derive interventions based on the results.	Provides clear instructions to select interventions based on the results. Cf. Methodological Fact Sheet 4.	Instead of at discretion, interventions are selected systematically and data-based, i.e. tailored to the target population.
Have not been scientifically tested.	Has been scientifically tested.	Its capacity to explain behavior and to reliably inform interventions has consistently been demonstrated.
Evaluate interventions through before/after analysis.	Evaluate interventions through before-after control trials.	Allows identification of the interventions' impact on behavior change.

In sum, while causing negligible additional costs over those of KAP surveys, the RANAS approach has the advantages of (1) considering a broad range of precisely defined behavioral factors, (2) providing a systematic and data-based method of selecting interventions, and (3) evaluating their impact conclusively.