Approaches to promoting behaviour-change around handwashing-with-soap

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Photo: WaterAid/ James Kiyimba

Kisakye Lakeri and Nafumba Erina at their primary school in Nanoko parish, in the central eastern part of Uganda, in May 2016. For the last few years WaterAid Uganda has worked with partners to support the improvement of conditions in the school, including starting a health club where pupils acquire the skills to become water, sanitation and hygiene ambassadors within the school and at home.

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Introduction

Prevention and control of infectious disease transmission is a daunting challenge worldwide.[1] Good hygiene practice is critical to the public health mission of reducing the transmission and consequences of disease. The two leading causes of childhood mortality worldwide are acute respiratory infections (ARI) and diarrhoeal diseases. They account for two-thirds of mortality in children under the age of five.[2] Both these diseases are associated with poor hygiene[3] and are transmitted through person-to-person contact, airborne droplets and contamination of the environment.[4] The provision of safe water and sanitation, and improved hygiene behaviours more generally, has the potential to alleviate the proximate causes of these illnesses and thereby improve health.[3] Infection control in low- and middle-income countries can be particularly challenging because of poor hygiene and sanitation, a lack of basic resources and personnel, and gaps in knowledge. To address these barriers, water, sanitation and hygiene (WASH) efforts need to focus on simple, sustainable solutions that can work in settings with limited resources.[1]

WaterAid has more than 20 years' experience in implementing hygiene promotion. Hygiene promotion was integrated into WaterAid's first strategy in 1995. In 2012 its hygiene framework was published. For the first time, in 2015, WaterAid's global strategy included hygiene as a separate aim. That strategy seeks to ensure that everyone everywhere has access to water, sanitation and hygiene by 2030. WaterAid aims to positively influence hygiene behaviours, to maximise the benefits of access to water and sanitation. In order to attain this goal, behaviour-change is crucial and so WaterAid is taking a few strategic shifts, listed below.

- Focusing on behaviour-change rather than improving people's knowledge.
- Targeting multiple but key behaviours, including handwashing with soap.
- Designing interventions through a creative process guided by formative research.
- Integrating hygiene into health, education and nutrition programmes, for greater impact.
- Strategically engaging in the national hygiene policy and strategy formulation process, and partnering in its implementation and monitoring.

In a bid to strengthen our hygiene intervention, this paper only focuses on handwashing with soap (HWWS) before proceeding to discuss major approaches and frameworks supporting HWWS. It goes beyond approaches deployed by WaterAid to canvas contemporary international theories and frameworks. This paper seeks to improve understanding of approaches used to promote HWWS, with a view to offering practical suggestions when selecting approaches.

Behaviour-change around handwashing with soap (HWWS)

HWWS has been suggested to be the most cost-effective way of reducing the global infectious disease burden.[5] Although rinsing hands with water is a common practice, the benefits associated with handwashing are largely attributed to the use of soap –

a far rarer practice. It has been estimated that HWWS in connection with five critical hygiene events – after defecation, after cleaning a child's bottom, before feeding infants/children, before eating and before food preparation – could reduce diarrhoeal diseases by 47% and respiratory infections by 23%, resulting in reduced infant and child mortality and increased child survival rates.[6] These critical events vary depending on the setting, such as at a hospital or in the home, and the exposure of the target population. However, designing effective behaviour-change interventions remains a challenge, especially when implemented at scale.

By exploring contemporary hygiene frameworks, this paper hopes to demystify hygiene literature and interpret it for implementation in the field.

Photo: WaterAid/ Mani Karmacharya

Female Community Health Volunteer Laxmi Khanal plays the wheel of hygiene game with mothers during a hygiene session at Jahada Health Post in Nepal, May 2016.

Knowledge improvement interventions are a low predictor for behaviour-change

Knowledge is a basic element of most handwashing promotion programmes. Traditionally, handwashing promotions focused on educating communities about the link between HWWS and disease prevention. Creating awareness about disease transmission mechanisms, and how to prevent diseases, by using positive inspirational messages can empower communities to act. Nevertheless, research shows that while educational approaches to hygiene practice can increase knowledge, they do not always result in sustained behaviour-change. While knowledge is necessary, by itself, it is not sufficient to support sustained

handwashing behaviour. Research shows that fear of disease, including messaging around germs, is not a strong handwashing motivator.[7]

For instance, a study in Ghana conducted by the London School of Hygiene and Tropical Medicine (LSHTM) observed 500 mothers of children under the age of five, and asked them a series of questions relating to their knowledge of handwashing, the steps involved in proper handwashing and their concerns about diarrhoea. The study showed that women with low knowledge of critical times for handwashing were less likely (40%) to wash their hands after defecation, compared to women with high knowledge (55%). In this study, handwashing practices did not include the use of soap. Also, interestingly, the level of childcare that the women provided, the age of the child and the level of education of the women had a much stronger influence on handwashing practices than knowledge.[8] Many other studies have reached similar conclusions: knowledge does influence handwashing behaviour, but it is not a very strong predictor of handwashing with soap.

The inference is that there are other factors that have a greater influence on behaviour. LSHTM explored the various motives that people have for being hygienic in 11 formative research studies in Africa (Ghana, Tanzania, Uganda, Madagascar, Senegal, Kenya), Asia (India, China, Vietnam, Kyrgyzstan) and Latin America (Peru). The studies found no evidence of improvement in handwashing behaviour flowing from an education approach concerning germs and disease risk. Most people already knew about the disease risk from not washing their hands – but they still did not do it. The studies found evidence that disgust, affiliation and nurture were relevant motives for handwashing.

Disgust was a powerful motivator for handwashing, but only when people felt their hands had become contaminated in the toilet. They felt water was sufficient to purify and remove this contamination.

Affiliation was also identified as key – people often behave hygienically for no other reason than that it is what everyone else is doing; as one Ugandan mother reported in the study, "washing hands to fit in is very common with us here".

Nurture was also mentioned as an important motive for handwashing, not so much for the children's health, but for mothers who cared deeply about their children's future success as social beings who have "good manners".

Comfort was also mentioned by mothers, who would always use soap to wash their hands when it was needed to remove grease, oil, fish or other adherent dirt. This means that their hands were more often washed after food handling, and not before. Fear of disease only seemed to motivate handwashing when there was a clear and present danger, such as during an outbreak. Otherwise, the notion of possible diarrhoeal diseases in children at some point in the future that might or might not happen was not a motivator for handwashing behaviour.[4]

Social status and prestige were found to be key emotional drivers for behaviour-change, such as becoming a 'SuperAmma',[9] and ideal mother[10] in society by performing certain behaviours.

Improving behaviour-change is possible, but it is a difficult undertaking. It is hard to get people to try something new, and even harder still to get them to maintain that change over time. HWWS trials have had notable success by focusing on reflective drivers of behaviour-change, such as social norms (e.g. good manners) and emotions (e.g. disgust), and reflexive drivers, those triggered automatically by familiar contextual cues, which help to form habits. Neal et al[11] suggest that a focus exclusively on reflective drivers often changes the person's beliefs without changing their actual behaviour, or it changes behaviour in the short-term but not in the long-term. Therefore, handwashing promotion interventions will be more effective when based on reflective and reflexive drivers.[i] With this in mind, this paper explores approaches that take in both drivers.

1. **Evolutionary-ecological model ('evo-eco' approach) and behaviour-centred design (BCD)**

These frameworks are founded on the understanding that the human brain has evolved over the years to provide adaptive behavioural responses to rapidly changing or complex environmental conditions, and that behaviour is actually a flexible and adaptive response to changes. Once a target behaviour has been identified in a setting, the evo-eco approach can be used to generate and test hypotheses about the behavioural determinants (determinants refer to internal and external factors that influence whether a person engages or not in a given behaviour). It can also be used to provide structure to formative research, to outline the design principles for behavioural determinants, and in the end, to explore the process by which behaviour-change happened.[12]

The three main components of this model are – brain, body and environment. This model proposes that to effectively change behaviour, practitioners should understand how the brain, body and environment interact to influence/determine behaviour. The environment represents the setting (physical, social and biological), which creates some kind of challenge/opportunity for the individual; the brain produces the subsequent response to the environment; and the body performs a behaviour via interaction with the environment. The brain sits within the body, and the body sits within the environment. Behaviours that programmes are interested in usually occur in a particular environment that strongly affects the behaviours.[12]

Understanding these three components is important for the following reasons.

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[i] Hygiene-related behaviours are prime candidates for habit formation because they involve relatively unconscious 'reflexive' actions. Indeed, evidence shows that simple context cues, such as the physical availability of soap and the presence of other 'nudges' (such as a conveniently located handwashing station) can be powerful determinants of whether people maintain handwashing behaviours over time.

Firstly, the space where the body, brain and environment interact is called the 'setting'. This is a crucial component of the evo-eco approach. Settings (physical, social and biological) define acceptable behaviour patterns and influence the behaviour of individuals entering that setting.

For instance, in some rural villages it is considered a good habit to brush your teeth with a stick. If a new person entering this setting brushes their teeth with anything else other than a stick, they are likely to be ridiculed and advised to use a stick – since it's the accepted behaviour in that setting.[13] Therefore, changing settings can be a powerful and sustainable way of changing behaviour.

During a food hygiene intervention in Nepal, groups of neighbours came together for 'kitchen makeovers' in which the kitchen space was repainted and decorated as a 'safe food hygiene zone'. They hung bunting and eye-catching danglers (visual reminders), and new 'behavioural scripts' (new norms/rules in the new kitchen settings) were suggested to them – all of which succeeded in creating new, safer food hygiene routine behaviours amongst mothers.[10]

Secondly, habits, by their nature, are very hard to institute, but if habits can be created they are likely to persist. Thirdly, motives can be harnessed to drive the behaviour in question. If disgust of dirt, smell or contamination is a key driver of hygiene behaviour then perhaps it can be harnessed to increase handwashing behaviour. Also if behaviour occurs publicly then perhaps it can be made a token of affiliation: it is what the 'group' does, and doing it rewards a person as a member of the group. Lastly, while it can be easy to conclude that the top-brain – the one that carries our conscious, rational planning – is in charge of our behaviour, mostly it is not. Long-term plans are weak in the face of immediate temptation, and often give way to habits. The best way to use our rational brains to change our behaviour may be to find clever ways to 'trick' us out of our ingrained habits, which are motives.[14]

The basic principle of evo-eco is reflected in the behaviour-centred design (BCD) approach. BCD draws on the knowledge and thinking of evo-eco to describe practical programme steps – ABCDE – that can be used to design, implement and monitor behaviour-change interventions that have a positive impact.[14]

The ABCDE steps involve the following:

<u>Assess</u> – here behaviour-change programme designers need to: start gathering information on what is known about the hygiene behaviours the programme will target, the target audience, the context and the parameters of the intervention. Based on the information collected, a hypothesis is developed about the barriers and enablers in that context, and this hypothesis informs the method by which change is achieved. A literature review and framing workshop can be done at this stage.

<u>Build</u> – this step involves carrying out targeted formative research, drawing from the information collected in the first step. The formative research fills in knowledge gaps,

explains determinants, motives and barriers, and explores and validates the hypothesis about the likely drivers of change.

Create – this step involves working with a creative team to design, package and test ideas on a small scale. Creativity is hard to package into a simple process, but it is vital if programmes are to be engaging and motivating enough to stand out in the busy lives of the programme's target audience. The result of the creative process is a package of surprising and disruptive intervention materials designed to have maximum effect on the target behaviour.

Deliver – here the programme designers develop a set of planned activities, which may involve direct and indirect contact via various channels, such as through community workers, events, interpersonal communication, and mass and/or digital media, appropriate to the audience and intended impact. This step can include monitoring to ensure that lessons are learnt for future interventions.

Evaluate – this step allows programmes to assess whether the expected outcomes have occurred. What is learnt from the evaluation should then provide the starting point for a new cycle of learning, by engaging in the BCD process again to develop a new programme.[14]

The 'SuperAmma' campaign in India,[9] 'Ideal mother food hygiene trial' in Nepal,[10] and 'Integrating hygiene into vaccination programme' demonstration project in Nepal[15] are examples of behaviour-change trials that have successfully used evo-eco to conduct formative research and behaviour-centred design (ABCDE) principles to design and implement behaviour-change. In the SuperAmma trial, HWWS was rare in the target villages before the campaign, but observations showed that, after 12 months, 29% of households were washing their hands with soap.[9] In the Ideal Mother Trial, the proportion of mothers practising all five key food hygiene behaviours (a composite performance) at the baseline stage was very low in the intervention and the control groups (around 2%). After the three-month intervention, the intended behaviours were more common in the intervention group (up to 43%) compared to the control group (2%).[10] These studies noted that there was still a lot more that could be done, both to spread the HWWS intervention on a larger scale and to convert motivated behaviours into sustainable habits.

2. Community-led total sanitation (CLTS)

CLTS has been used in many countries, supported by donors and adopted by many public and private implementing agencies, mainly to tackle open defecation in communities through a process of 'triggering'.[16] This review noted that there are few examples of how CLTS has been deployed to trigger realisation among communities of the importance of HWWS after toilet use.[17]

In an interesting pilot study, UNICEF used CLTS to trigger handwashing behaviour-change in Malawi. In this study, UNICEF developed and used ten triggering tools to invoke shame and disgust around poor or absent handwashing practices, especially after using the toilet. The ten triggering tools include: anal cleaning material (leaves,

etc), 'shit and shake', cassava/egg demonstration, charcoal smearing, smelly hands, faeces on baby nappies, 'scratch and smell', wall contamination, food sharing, and dirt under fingernails. The triggers aimed to engender the following realisations: there are various sources of hand contamination with faeces and other germs; HWWS is a complete way to remove all contamination (dirt, smell, and germs); and hands that appear clean can still have dirt on them.[18]

While CLTS has been effective in triggering spontaneous and sometimes long-term abandonment of open defecation in some rural communities, its effectiveness in triggering HWWS is largely unknown. In the above pilot study, it was not reported if the HWWS triggering process resulted in long-term behaviour-change. However, the example provides us with an opportunity to learn and incorporate handwashing in CLTS-triggering activities.

Photo: WaterAid/ Ernest Randriarimalala

Hasina washing her hands at a tippy tap after using the toilet, in Manakasina village, Madagascar, in September 2016.

3. Focus on opportunity, ability and motivation (FOAM)

The FOAM framework, designed by the World Bank Water and Sanitation Programme (WSP), was designed during the global scaling-up handwashing project to respond to the need for a common conceptual framework to guide, monitor and evaluate handwashing behaviour-change interventions. The framework was designed to improve understanding of why people sometimes wash their hands with soap and why they don't at other times. FOAM can be used to help: focus interventions on priority behaviours and populations, identify gaps in an ongoing intervention, analyse formative research results, inform behaviour-change

intervention design, inform implementation, and monitor appropriate programme indicators.[19]

The FOAM framework determines four core elements of hygiene promotion programmes that all need to be addressed in order to achieve behaviour-change. The four key elements are represented in the acronym FOAM: focus, opportunity, ability and motivation.[19]

Focus the intervention – clearly defining the target population and the desired behaviour are critical elements of any behaviour-change intervention.[19] Behaviour-change interventions also need to understand the environment in which practices occur. Who can influence and support behaviour-change? What would motivate behaviour-change? What drivers motivate change? What are the key barriers to overcome to promote the desired behaviour?[20]

Opportunity refers to external factors affecting a person's behaviour, over which they may have less control. Behaviour-change interventions should strive to answer the following question – is it possible to practise the desired behaviour in the specific physical and social environment? Social norms, product attributes and access to or availability of product are some of the external factors that affect behaviour. Behaviour-change interventions should therefore include a map of factors affecting opportunity to practise.

Ability reflects an individual's perceived or actual capacity to perform a given behaviour. Are people capable of practising the behaviour? Do they have the knowledge, time and money? Examples of ability determinants are knowledge, self-efficacy and social support.

Motivation is about whether people *want* to perform the behaviour (beliefs, attitudes, values, social pressure). Are they willing to change? Motivation reflects whether, given opportunity and ability, performing the behaviour is in an individual's self-interest.

A key strength of FOAM is that it is a simple tool that can be used to identify the behavioural determinants that either promote or constrain behaviour-change. For HWWS, the framework breaks the behaviour down into behavioural determinants to see which determinants, when mediated in a particular setting with a specific target population, are most likely to have the greatest impact on handwashing behaviour.[19] FOAM can act as a lens through which to consider programme design and engage with theory, while providing a level of structure to programme design.

While the FOAM approach provides programmes with a simple structure to guide behaviour-change interventions, finding successful examples of behaviour-change using this approach to include in this review was a challenge.

4. Integrated behavioural model for water, sanitation and hygiene (IBM-WASH)

The integrated behavioural model for water, sanitation, and hygiene (IBM-WASH) was developed after a review of existing behaviour-change frameworks and models. The developers of the model found that existing tools undervalued the role of technology (objects and infrastructure) in influencing behaviour, having focused primarily on individual-level determinants. IBM-WASH proposes a new model in response to these perceived weaknesses, and urges a thorough assessment of multi-dimensional factors that influence WASH.[21]

The **contextual** dimension represents the background characteristics of the setting, individuals or environment that are often beyond the scope of influence of WASH programme activities; however, they exert significant influence on the adoption of specific products or behaviours. For instance, access to markets and products, access to enabling resources (e.g. water for handwashing or water treatment), socio-economic and demographic characteristics of households (e.g. inability to access credit may deter poor households from investing in a household toilet), and the built and natural environment. There may be important variations in access to improved technologies and opportunities to practise improved behaviours within the same community setting. Understanding and recognising these variations is vital to developing a complete understanding of the contexts in which behaviour occurs.

The **psychosocial** dimension relates to the factors (behavioural, social or psychological) that are within the scope of influence of a behaviour-change activity, and are often the focus of behaviour-change interventions (behavioural determinants). Examples include disgust, nurture, comfort, etc. The model recognises that social norms are an important element of the psychology of changing behaviour.

The **technological** dimension takes in all tangible products, facilities or devices that can directly influence the adoption of a new behaviour. The characteristics of the technology can have a strong influence on behavioural outcomes, and may include the location of the products (location of handwashing station may facilitate or inhibit handwashing practices), or an attribute of the technology (handwashing tap design, soap presentation) can influence acceptability and use of the product. Ease of use can influence technology preference and behaviour-change.

The five levels present different influencing factors for each of the three dimensions.

The **societal/structural** level takes in broad organisational, institutional or cultural factors that influence behaviours in each of the above three dimensions. Examples include factors such as laws, policies, climate, geography, geology, and manufacturing and commercial distribution of products.

The **community** level includes the physical and social environment in which individuals are nested, as well as the formal and informal institutions that shape individual experiences.

The **interpersonal/household** level is concerned with interactions between individuals and the people they intimately associate with, including household members, close friends and neighbours. Factors at this level include roles and responsibilities in the household, household wealth and social norms.

The **individual** level includes socio-demographic factors, such as age, gender and attitude towards a product.

The **habitual** level reflects the fact that the opportunity and necessity for WASH-related behaviours are repeated over the course of the day, and the multiple processes can result in the specific behaviour becoming a habit.

As pointed out by Dreibelbis et al,[21] IBM-WASH encourages programmes to acknowledge the various levels of influence within the larger societal and communal context that may shape behavioural level outcomes. The approach encourages consideration of the full set of determinants for a specific behavioural intervention in design. It often points out where more qualitative data collection will help to understand the technological, psychological and contextual dimensions at play.

5. Small doable action (SDA) approach

Unlike other behaviour-change approaches, which assume that households are not engaging in ideal practices because they are unaware, and that awareness-raising and education, with a bit of motivation, will catalyse ideal hygiene practices, the small doable actions (SDA) approach is based on the notion that people rarely go from current practice to the ideal practice in one step. It therefore emphasises the importance of constructing a continuum of behaviours that spans from unacceptable to ideal, and it encourages households to move gradually from one step to the next.[22]

In the context of household-focused WASH improvements, once the progression of SDAs is identified, community hygiene promotion agents negotiate with the individual households to promote advancement along the continuum towards the ideal practices. The negotiation involves the agent assessing current hygiene practices at the household level, identifying one or a few practices for improvement, and actively problem-solving to overcome barriers or resistance to make the selected SDA easier to do.

Questions posed by the agent include: what makes the SDA hard to do, what would make it easier to do, and who approves or disapproves of you spending time and resources doing it (for example, washing your hands with soap before eating or preparing food)? The negotiation ends with a commitment to try the improved practice(s), and requires follow-up (perhaps with another round of negotiation and/or commitment to the current or an advanced SDA) to ensure sustained behaviour-change.[22]

SDAs are behaviours that are considered feasible from the householder's point of view, given accessible resources, and that are likely to be effective in bringing about

positive behaviour-change. Behaviours that meet these two criteria – feasible and effective – are considered SDAs and are included in the menu of options for WASH behavioural improvement. 'Stepping stone' behaviours that do not directly yield impact are not considered SDAs. To ensure success, the approach focuses on achievable objectives and targets.[22]

SDAs can also be used to increase access to WASH infrastructure. There are certain basic improvements to WASH infrastructure that are solidly in the domain of local governments, households, communities and institutions, such as building handwashing stations in public facilities, designing and using tippy taps, repairing leaking toilets, raising toilet platforms, etc. These small improvements can also be SDAs that can improve WASH outcomes by addressing hardware challenges.[23]

In an example from Bangladesh, USAID Washplus/Bangladesh successfully incorporated the small doable action approach to improve WASH infrastructure and behaviour in hard-to-reach areas of southwest Bangladesh. In the project area, households were encouraged to take small, feasible, yet effective improvements that helped them move towards the ideal practice. SDA reoriented communities from expecting donations from NGOs to looking into solutions that were within their means. For one SDA, designed to reduce food contamination, the project worked with households to introduce handwashing tippy taps near food preparation areas. Potties, child-friendly toilets and child defecation disposal techniques were other SDAs used.[23]

SDAs are very personal to the individual or household, and cater to the behaviours of the individual, no matter their socio-economic standing or resource constraints.[24]

6. Participatory hygiene and sanitation transformation (PHAST) approach

Participatory hygiene and sanitation transformation (PHAST) has been implemented in many countries, with varying degrees of success. Unfortunately there is no data available to demonstrate the effectiveness of this approach with respect to hygiene behaviour-change or reduction in diarrhoeal diseases.[25]

PHAST is a model that is used in a wide range of settings where communities solve their own hygiene problems with the guidance of trained facilitators.[26] PHAST is based on the principle that the participation of communities in their own projects will empower the community and improve their decision-making about the services they need and want to maintain. As communities gain awareness of their WASH situation through participatory activities, they are empowered to develop and carry out their own plans to improve this situation. PHAST is based on seven steps using participatory tools, from problem identification and analysis, to planning and selection of appropriate solutions. These vary and could include both construction and management of new physical facilities, as well as adoption of safer individual and collective behaviours.[26]

The main challenges with this approach are as follows.
- Very difficult to scale-up.
- Difficult to train a large number of staff, so activities tend to only reach a small minority of people in each village.
- Requires too many contacts (often up to six meetings) to be practical.
- Very difficult to set particular behaviour-change targets or to measure any resulting changes.[27]

7. Psychology of habit, or science of habit

Habit is defined as "a learned, reflex-like behaviour that is triggered unconsciously by familiar cues in a certain context (this could include physical settings, time of day)." When certain actions/behaviours are repeated frequently and in the same settings (for instance, preparing food in the kitchen, defecating outside or not washing hands after the toilet), or in the same sequence (e.g. cook then eat, eat then wash), gradually the behaviour becomes a habit and the settings in which that behaviour happens become the cue that triggers that behaviour. Once a habit is formed, it may substitute for, or override, conscious decision-making. Habit also blocks conscious awareness and exploration of choices and triggers, and can inhibit adoption of a new behaviour. Over the years, great advances have been made in the scientific study of habit, including insights about how habits are adopted, how they can be triggered in daily life, and how they can successfully be disrupted and changed to promote behaviour-change. By tailoring handwashing behaviour-change efforts to fit people's current habits and contexts, interventions can disrupt less healthy behaviour and create lasting healthy habits. In this approach, Neal et al.[11] discuss six principles designed specifically to foster adoption of new habits in handwashing behaviour. Principles 1 and 2 address preconditions for change, principles 3 and 4 address trial or early adoption, and principles 5 and 6 address maintenance of new behaviour.[11]

Principle 1: Ensure a stable, supporting environment

Behaviour-change interventions need to ensure that supportive environments/products for new behaviour are immediate and consistently available in order for people to initiate new habits. This principle defines a supporting environment for handwashing as 1) a designated and consistently available place for handwashing that 2) has soap and water present and that 3) can be accessed with minimal effort at all critical times for handwashing, especially after toilet use and before handling food. Where possible, interventions should strive to ensure that each of these three elements are consistently in place, so that behaviour can be easily repeated.[11]

Principle 2: Leverage context

In addition to ensuring that a supportive environment is available (principle 1), a behaviour-change intervention should also find ways to leverage context to support habit change. Leveraging context can be done by either targeting people when existing habits have been temporarily disrupted by context change (e.g. after childbirth, after moving house/village/town, during an epidemic, etc) or by piggybacking a new handwashing practice onto existing behaviour. A large change in context creates an opportunity for a new habit to replace old habits.

Principle 3: Eliminating friction

Simply put, this principle requires that a new intervention be easy to perform. Studies looking at relapse following interventions to promote new habits found that one key behaviour relapse trigger is perception that the new behaviour will be harder than the old behaviour. When asked to do something, people will normally reject behaviour that requires even the smallest amount of decision-making. The old behaviour has a great advantage because it is familiar and therefore very easy to carry out. Here, behaviour-change interventions can learn from marketing or product advertising – to reduce friction, businesses package or advertise their product as convenient or easy to use, in order to make their products more appealing to people. When promoting handwashing, it's important to assess the extent to which the need for decision making can reduce potential friction and make the practice easier. For instance, there are five critical times where handwashing with soap is necessary. Promoting a detailed regimen of the critical times for handwashing can be perceived as being very cumbersome and may actually deter handwashing practice in the long run. However, placing handwashing stations outside the toilet or in the direct path of a person exiting the toilet can diminish the amount of effort needed to perform that behaviour.[11]

Principle 4: Provide 'ownable' cues

Habits are generally connected to triggers in the immediate environment. Principle 2 (leverage context) discusses ways in which triggers can be used to increase the frequency and/or probability of a behaviour. Principle 4 explores additional cueing tactics, in particular, visible cues in the environment. Research shows that people may unconsciously associate certain behaviours, such as smoking, with given locations, such as in front of a building, or in conjunction with other behaviour, like drinking a cup of coffee. Over time, these contexts come to act as powerful nudges that prompt people to repeat behaviour. Such associative learning of behaviour can be harnessed to promote behaviour-change. If a person practises a new behaviour in a consistent context with visual and other cues, the behaviour is more likely to become habitual.[11]

Innovative cues or nudges in schools have more recently included brightly coloured handwashing stations, coloured paths, and painted footsteps from latrines to handwashing stations. In 2014, Save the Children piloted an alternative low-cost approach in Bangladesh where environmental cues were used to guide handwashing with soap after toilet use. The intervention was implemented in two rural schools in Bangladesh. Handwashing stations were positioned near the latrines and connected via brightly coloured, paved pathways. Handwashing increased from 4% to 74% in six weeks.[28] This approach was tested in a small setting (two schools), so testing it again at a larger scale is paramount.

There is a need to test nudges and cues to assess their suitability in specific contexts and the sustainability of behaviours, and later, regular evaluation is warranted.

Photo: WaterAid/ Kate Holt

Andry Ramanantsoa, Project Director at one of WaterAid's partners in Morondava, Madagascar, stands next to a handwashing station built at a hospital in April 2016.

Principle 5: Encourage practice ('intervention through doing')
Forming a habit is different from most forms of learning through verbal and/or visual instruction. Research into brain activity has demonstrated that people who have learned behaviour through observation alone may have understood rationally how and when to execute a behaviour, but they never engage the habit system of their brains. On the other hand, those who learn behaviour through trial and error (i.e. repeating the behaviour) engage the habit system and master the behaviour.

A key implication for behaviour-change intervention is that although instruction and observation may be useful to explain a new behaviour to people, habit will not emerge in the absence of actual practice/doing of the behaviour. Therefore, interventions that introduce new behaviour should include activities that engage the target population in repetition of the new behaviour. Handwashing interventions often include explanation of the necessary steps involved in handwashing and perhaps a demonstration of handwashing. Efforts should be made to allow the target population to practise handwashing with soap. To ensure the behaviour is practised regularly, efforts should be made to stimulate repeated practice in the context, such as through public pledges or group handwashing activities. Finding ways in which the handwashing practice can be repeated makes the behaviour 'stick'.[11]

Principle 6: Promote meaning and motivation, even for habits
Generally people don't embrace the idea that they are creatures of habit. Instead, they prefer to view their actions/behaviour as the product of choices, conscious motives, personal preference and goals. Insights from psychology and sociology show that people's behaviour and decisions are an outcome of cognitive variables. Following research in the field, key factors that guide decision making, and in turn influence people's behaviour, can be categorised as follows:

1. **Loss aversion**: people prefer to avoid losses rather than acquiring equivalent gains. Thus, framing behaviour-change information in terms of losses rather than gains may have a stronger motivational impact.

2. **Reference point:** people may evaluate changes relative to some reference point, rather than objectively, e.g. based on past experience, the value of their choices, and/or based on relevance to them.

3. **Time inconsistency**: over time people tend to change their valuation of products and/or put off tasks that do not have well-defined or near-term benefits or costs. For instance, in Kenya sending weekly text message reminders emphasising near-term benefits increased antiretroviral therapy treatment adherence from 40% to 53%.[29]

4. **Social factors**: an individual's choices, decisions and preferences can be affected by the choices of others.

The implications of loss aversion, reference point and time inconsistency are:

1. **The default choice**: people may engage in as little active decision-making as possible. Studies show the default option is chosen more often.

2. **The endowment effect**: people tend to value what they possess.

3. **The status quo bias**: people may be averse to change. People may not change from an established way of doing things, even if the costs are low and the benefits are high. This could be motivated by the value placed on familiarity and fear of the unknown.

What does all this mean for behaviour-change interventions? Understanding how people rationalise their behaviour can be useful in designing appropriate interventions (and messages) that nudge the target population into performing or adopting the decision to perform certain behaviour. Knowing how people think and rationalise their decisions can help practitioners experiment with new ways of messaging and new WASH hardware.[11]

The science of habit concept emphasises the importance of making behaviour a habit. It offers simple and practical ideas that can be incorporated in any behaviour-change intervention to encourage positive hygiene behaviour habits. Nudging and

nurturing habit has distinct potential to increase the likelihood of individuals adopting and sustaining HWWS. However, habit drivers do not constitute an intervention in themselves. They should be used as complements in interventions that address both reflective and reflexive drivers.

Learning from this literature review

There are multiple approaches to behaviour-change, ranging from cognitive, knowledge-based principles to those based on emotions and changes in behavioural settings. The diversity of approaches available illuminates the complexity of human behaviour: hardware and software must work together, environment and mind affect each other, specified motives and emotional factors should be isolated, and interventions need to engage with social norms. To achieve this, an intervention needs adequate time and flexibility to consult a range of approaches and frameworks, and to take from each what is useful.

Behaviour-change frameworks also help to inform the design of and results of formative research; identify, understand and explain a range of factors that influence behaviour; focus interventions on particular behavioural determinants; and inform all stages of the programme/project lifecycle – design, implementation, monitoring and evaluation.

When HWWS promotion is delivered within a wider WASH programme (i.e. programmes that focus on construction of WASH facilities and include a hygiene/behaviour-change component) there can be **a lack of emphasis on the hygiene/behaviour-change component**. This can lead to a lack of hygiene resources (funding, time and expertise) to conduct thorough hygiene formative research, which is key in designing context-sensitive needs-driven behaviour-change.[24] There is a need for WASH programmes to include strategic planning, finance, skilled staff and a commitment to gaining insight into the hygiene aspects of the intervention.

Behaviour-change hygiene promotion programmes that just tell people what to do are gradually being replaced by promotion that deploys psychological, physiological, environmental and habitual levers informed by how and why different groups think, behave and change specific hygiene habits.

Analysis of what motivates people to adopt better hygiene practices shows that social and economic reasons are often more influential than better health, which has been the key message in the past. This is not that surprising: poor health often takes a long time to manifest. Social benefits, such as cleanliness, status and dignity, are derived immediately. Gratification is within grasp. We are now realising that programmes should be guided by near-term motivations, rather than distant headline benefits.

Overall, the most important thing we have learnt about handwashing with soap is that it is not what people *know* that determines what they do. Most people know they

should wash their hands with soap, but they do not do it. When they do it, they often do it because they are driven by disgust, status, affiliation and nurture, rather than health. These are emotive drivers. We have also learnt that, like all other human behaviour, unless handwashing becomes a habit – something individuals do automatically – we should anticipate that it will not be sustained.

On the surface, HWWS appears to be a natural area for mutual benefit with **private sector** companies. Engaging with the private sector has huge potential in terms of implementing HWWS interventions at scale. However, there are equity issues in partnering with the private sector, which is naturally profit-driven. Profit may drive businesses to target higher socio-economic groups and ignore the needs of lower socio-economic groups who might benefit the most from handwashing. Partnerships with the private sector should explore new platforms to increase profits in rural areas and amongst poor groups, which will give private enterprise a sustainable incentive to target vulnerable groups who will enjoy increased equity and access to WASH resources.[24]

An enabling environment – factors that influence a person's ability to wash their hands have often been overlooked in behaviour-change interventions, with much of the focus having been on identifying the motivations behind behaviour. Research suggests convenient access to water and soap, when and where needed, and having a designated, stable handwashing station in place are important determinants for handwashing.

Behaviour-change interventions should not assume that as long as people in communities are given easy to durable and ventilated enabling products (toilets, handwashing stations, potties, etc.), they will be more likely to use them. To increase the use of these products, behavioural economists emphasise that it is important to look at practical attributes that attract product use, such as the person's reaction to a product, the colour and size of a product, or the feel of a product. These are not influences that can be verified through observation. What's needed instead is empirical testing with, say, different coloured products to understand if colour is a trigger or not. Trials and testing can increase the effectiveness of scaled interventions. However, they often entail more time, planning and resources.[30]

Achieving universal HWWS requires both technologies and also behaviours. We need to be aware that people have priorities for how they use water and soap. Often HWWS is not a priority when water is scarce, and soap is prioritised for bathing and washing clothes. HWWS interventions should strive to change the way people think about water and soap, and how they prioritise using it. This requires changes in norms and habits, and also infrastructure to deliver adequate water, storage and soap.

Photo: WaterAid/ Simi Vijay

A nurse washing her hands thoroughly using antiseptic handwash at the Family Clinic Area 2 Primary Health Centre in Abuja, Nigeria.

Conclusion

The approaches and frameworks in this paper can be used to research or analyse behaviour, plan a behaviour-change intervention, improve an ongoing intervention or guide the evaluation of an intervention. By learning how to identify some of the internal and external factors that influence behaviour we can design and deliver more successful behaviour-change interventions and systematically eliminate potential barriers along the way.

To ensure effective handwashing intervention, programmes need to understand the behavioural determinants specific to handwashing and use them while designing an intervention. Behavioural determinants can be defined as internal or external factors that influence whether a person engages in a given behaviour. Internal factors take place in a person's mind (e.g. social norms, beliefs, knowledge), while external factors are those that are either in their environment (physical factors, such as visual and other cues) or are somehow beyond their control (access to WASH resources). The better programmes are at identifying determinants and understanding their influence on behaviour, the more effective and evidence-based behaviour-change programmes will be. Designing interventions through a creative process and implementing them using novel approaches are imperative to creating behaviour-change.

The frameworks and approaches laid out in this paper allow us to gain greater insight into why people do or don't do things, how to make them choose an improved behaviour and how to encourage them to keep that behaviour in future.

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