

Beyond tippy-taps: The role of enabling products in scaling up and sustaining handwashing

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Factors that influence individuals' opportunity to handwash have often been overlooked in hygiene promotion initiatives, with much of the focus having been on motivation. This article summarizes findings from the Water and Sanitation's Global Scaling Up Handwashing Project and other research that suggest that convenient access to water and soap when and where needed and having a designated place for HWWS are also important determinants for handwashing. Enabling products such as handwashing stations provide such a designated place in addition to an environmental cue to action and a stable context for handwashing, factors that the literature highlights as critical for habits to form and be maintained. WSP recently conducted a landscape of enabling products and many identified to date are tippy-taps. However, the learning from a design consultancy for a handwashing station for rural Vietnamese households is that appearances may matter and that designing features that take into account user preferences and practices is essential.

Keywords: handwashing, handwashing stations, determinants of handwashing, handwashing habit, cues to handwashing, design, enabling products

Handwashing with soap reduces the diarrhoea by almost half and acute respiratory infections by roughly a third

HANDWASHING WITH SOAP has been shown to reduce the incidence of diarrhoea by almost half and acute respiratory infections by roughly a third. Yet the rates of handwashing with soap remain low – as low as 5–15 per cent (Scott et al., 2003) – particularly at critical times when there is a risk of faecal-oral contamination, such as having used a toilet or before preparing food.

The Water and Sanitation Program (WSP) of the World Bank is implementing the Global Scaling Up Handwashing Project (herein referred to as the Project) with support from the Bill & Melinda Gates Foundation. The Project is testing whether innovative promotional approaches to behaviour change can generate widespread

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© Practical Action Publishing, 2010, www.practicalactionpublishing.org
doi: 10.3362/1756-3488.2010.033, ISSN: 0262-8104 (print) 1756-3488 (online)

Sinks in kitchens and bathrooms are the norm in developed nations, but not in resource-scarce countries

Convenient and easy access to water and soap at critical times is a key behavioural determinant of HWWS

improvements in handwashing with soap (HWWS) in Peru, Senegal, Tanzania and Vietnam.

The Project has a significant learning objective, an important component of which is to ascertain the key factors (also known as determinants) that influence HWWS behaviour. Of particular and growing interest is the role of washstands, tippy-taps or other technologies (coined 'enabling products') that facilitate handwashing when and where there is no piped water or conventional sink in close proximity to the latrine or the food preparation area. While sinks in kitchens and bathrooms are the norm in developed nations, they are not in most resource-scarce countries. An emergent Project hypothesis is that if a busy mother needs to spend time looking for soap before preparing a meal or a child does not have easy access to water and soap after using the latrine, the probability of HWWS actually taking place is lower. Convenient and easy access to both water and soap at critical times is believed to be a key behavioural determinant of HWWS among the targeted population of the Project which is mothers and young children.

The purpose of this article is to share the learning of the Project in the area of enabling products, particularly in their potential role to facilitate the formation of a handwashing habit. Programme implementers will learn why integrating a component focusing on increasing convenient access to soap and water may be critical. Practical tips are shared on elements to consider if developing a handwashing station.

Using a framework to understand handwashing behaviour

As part of the Project, WSP developed a framework to help understand and analyse why carers, children or other segments of the population do or don't wash their hands. Known as FOAM (Focus on Opportunity, Ability and Motivation), the framework identifies the factors (called determinants) that influence handwashing (Coombes and Devine, 2009). The factors are classified under three categories, depending on whether they relate to people's chance to wash their hands (opportunity determinants), resources (ability determinants) or drives (motivation determinants). WSP has been using the framework (see Figure 1 by Nguyen in this edition) to inform the design of its formative research, interventions and monitoring strategy and tools.

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Access and availability

Of particular interest to this article is access/availability to soap and water, which falls under the opportunity category of determinants. Ease of access to water has been identified as a potential environmental facilitator in *The Handwashing Handbook* by Cardosi et al. (2007). A review by the London School of Hygiene and Tropical Medicine of formative research in 11 countries found that soap was present in 95 per cent of households in the studies that recorded it. The review further pointed out that soap bars tended to be kept out of reach or wrapped and that water was often only available if an effort was made to fetch it. Lack of a specific place for handwashing was flagged as a major environmental constraint (Curtis et al., 2009).

Emergent learning from the Project is that access/availability is significantly correlated to handwashing. A comparison of Senegalese mothers who wash their hands with soap with those who do not revealed that convenient access to soap and water at critical times may well be the most important determinant (Kane, 2009). Similarly in Peru, having a designated place for handwashing emerged as a significantly correlated determinant based on a large survey of primary carers as part of the Project's impact evaluation baseline (Delisio, 2009). Project managers in both countries have re-oriented their intervention to strengthen carers' skills to manage soap and water for handwashing purposes within the household and create a designated place for handwashing. The Project's findings support previous studies such as that in rural Bangladesh households which concluded that interventions that improve the presence of water and soap at the designated place for handwashing could improve handwashing behaviour (Luby et al., 2009). In Ghana, 61 per cent of mothers observed in a study using soap after going to the toilet took it from a nearby table (Scott et al., 2007). Similarly, in Kerala, India, the households where all women reported washing their hands with soap were more likely to be among the households that kept soap and water next to the toilet (Cairncross et al., 2005).

Enabling products

Given the importance of convenient access and availability of soap and water when and where needed, the Project has introduced additional learning activities on *enabling products*. Enabling products are some of the external factors that influence individuals' opportunity to perform a behaviour, regardless of their ability and motivation to take action. Often overlooked in the design of handwashing initiatives, these external factors have been shown to facilitate handwashing behaviour. Biran et al. (2005), for example, found an association

Lack of soap and paper towels and inconveniently placed sinks are factors for poor hand hygiene

between increased rates of HWWS after latrine use and ownership of a washstand in Kyrgyzstan. Parallels can be found in industrialized countries; lack of soap and paper towels and inconveniently placed sinks were among the self-reported factors for poor adherence to hand hygiene in a study conducted among health care workers (Pittet, 2000). In health care settings, easy access to a sink, soap or alcohol-based hand-rub solution is deemed essential for adherence to hand hygiene recommendations (CDC, 2002).

Enabling products can be found in many fields such as public health. For example, beads (such as CycleBeads) are promoted in some interventions to assist women practising natural contraception in tracking their menstrual cycle. HIV-positive patients are encouraged to organize their pills in small boxes with compartments labelled by days of the week to facilitate compliance to the prescribed regimen.

With respect to handwashing, enabling products can help do any of the following:

Tippy-taps are devices to store and regulate the flow of water in sufficient quantity to facilitate handwashing

- *Store and regulate the flow of water in sufficient quantity to facilitate handwashing.* Tippy-taps – which are devices made from commonly available materials (such as a jerry can suspended on a stand) – are perhaps the best known example, though there are other such technologies such as the bushproof handwasher and the hy2u.
- *Manage or store soap within a household or institution (e.g. school, workplace).* The end purpose is to prevent wastage, theft or spoilage or to facilitate access. Soap nets, soaps on a rope and soap dishes are examples.



An example of the tippy-tap in Tanzania



Simple, practical soap storage



A prototype handwashing station in Vietnam

- *Bring together water and soap in one place.* Enabling products such as handwashing stations provide a designated space to wash hands with soap in the household or in an institutional setting that is, ideally, in close proximity to the toilet or the food preparation area.

Towards a landscape of enabling products

WSP compiled an inventory of existing enabling products, which is a searchable database on its website

WSP recently compiled an inventory of existing enabling products and made it available as a searchable database on its website (<http://www.wsp.org/scalinguphandwashing/enablingtechnologies>). The resource guide is intended to serve as a 'one-stop shopping' online reference for programme managers, where they are able to find key information on the various types of enabling product including but not limited to purpose/benefits, key product features/specifications, pictures or illustrations, and contact person for further information. This will assist programme managers in selecting options which could be useful to their own programme needs. The resource guide was developed based on information derived from a review of grey and published literature, informant interviews and input received from emails and postings on list-serves. Users can submit information on additional products allowing the database to grow over time. By the end of June 2010, WSP had catalogued over 60 enabling products, the majority of which can be coined DIY ('do it yourself').

WSP will also be conducting case studies in 2010 to investigate the process in which some of the enabling products have been developed, what results were obtained and what lessons can be learned. They will inform the water and sanitation, hygiene promotion and public health communities on the potential role, value and limitations of enabling products and provide insights into promising practices to maximize scale and sustainability.

Insights from designing a handwashing station for rural Vietnamese households

In Vietnam, the Project is using an array of interventions to promote handwashing among mothers and children in rural areas, including mass media, community and school-based events and interpersonal communication through the Vietnam Women's Union (WU), a grass-roots organization which counts some 13 million members nationwide. Prior to project implementation, handwashing rates with water alone were much greater than with soap, despite the fact that all households have some form of soap, whether laundry detergent (100 per cent), dishwashing liquid (88 per cent) or bar soap (60 per cent) (Indochina Research, 2007). The Project is working on changing beliefs and attitudes which underlie the behaviours. Through the Women's Union, it is also hoping to strengthen mothers' capacity to manage soap and water for handwashing and make both easily accessible at a designated place.

Knowing that a handwashing station would greatly facilitate this last objective, WSP contracted a consultant to develop rough design concepts in April 2009. The consultant recruited was an IDEO designer who happened to be on personal leave working on a low-cost latrine in Cambodia. The consultant/designer led a highly participative process involving stakeholders and implementing partners in meetings, field visits and two rounds of prototype building and user field testing based on human-centred design principles. In principle, human-centred design takes into account user needs and preferences at every stage of the design process. (For more information on human-centred design, see www.ideo.com). Though the consultancy was too short to arrive at a final design direction, the process yielded invaluable insights into the mechanics of handwashing and user preferences (Chapin, 2009), including the following:

- *Tap design.* Rural Vietnamese people strongly preferred a tap which allows water to run freely over their hands as they rub them together to get rid of soap. Having to continuously depress a lever makes rinsing very difficult. An ability to adjust the flow rate and to control the on-off with the back of the hand or some

In rural Vietnam handwashing rates with water alone were much greater than with soap

Rural Vietnamese people strongly preferred a tap which allows water to run freely over their hands

other clean body part (to keep the tap hygienic) was deemed important.

- *Soap presentation.* Prototypes providing for a bar of soap were well liked, with a preference for a hanging bag (over a covered dish) which would allow for the bar to dry and prevent it from getting misplaced or stolen. A powder shaker which would allow for dispensing of laundry soap tested poorly as did a liquid (dishwashing) bottle nipple dispenser. In the latter case, users were unable to divorce the baby bottle used from its intended purpose, providing an important lesson for future prototyping: avoid using products or materials with strong connotations.
- *Container parameters.* People stated they would mount the station on a wall or post rather than rest it on a stand as it would seem like a more permanent installation, which was desirable. In this respect, a rectilinear container is preferable to a round one. Users stated that they would bring water to the container to refill it rather than the reverse. In this light, a clear container allowing them to see the level of water and a capacity of 10 to 15 litres (enough for a projected 1–2 days of household use) were other important features. Finally, a flip lid was preferred over a removable lid which could be misplaced.

Learning points for designing handwashing stations

Though the findings from the Vietnam design process cannot be generalized to other areas, there are some key lessons learned for programme managers who wish to embark on the design of a handwashing station. They are as follows:

1. *Test, test and re-test.* Multiple iterations of prototyping and field testing with household members are critical to identify user preferences and handwashing practices. Programme managers need to take this into account in their planning and budgeting.
2. *No one model fits all.* Programme managers should not transplant technologies from one country to another without prior field testing. A handwashing station that is currently mass-produced and promoted through partners of the Project in Peru tested poorly in rural Vietnam indicating that a universal design may not be possible.
3. *The mechanics of handwashing are complex.* Field testing revealed that the mechanics of handwashing are more complex than were assumed. The research needs to examine what part of the hand is used to start the water flow (no finger tips in the case of rural Vietnam), the preferred body position (squatting in the

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A well-placed handwashing station would remind families to wash their hands with soap

case of rural Vietnam) and the hand motion (extensive rubbing in the case of rural Vietnam) to inform feature design.

4. *Appearances count.* Programme managers need to keep in mind that handwashing stations may fulfil an aspirational and social status role in addition to providing functional benefits. Users in rural Vietnam expressed the need for something that looked nice and new and would be willing to spend more for a station if installed in a location visible to neighbours.
5. *Size does matter.* Understanding user preferences in terms of how and how often they want to refill the water as well as who in the household would be assigned this task is important to determine the size of the container. As stated earlier, users in rural Vietnam stated they would prefer to bring water to the container rather the other way around; a handwashing station for this population would need to hold enough water for few days of use.
6. *Hire a real designer.* The valuable outcome from the Vietnam process could not have been obtained without a qualified and experienced designer who is practised in user-centred processes. Programme managers need to budget accordingly and should consider preparing a simple brief as part of their contracting (see Box 1) which provides an initial guidance to the designer on the context and intended purpose and serves as a platform for discussion.
7. *A station as possible cue to action.* In the Vietnam design process, women freely stated that a well-placed station would

Box 1. Sample design brief for a handwashing station from Vietnam

The Big Idea: Develop rough design for HWWS station to be used in rural households in Vietnam.

Users:

- Rural household members (adults, children) near latrine or food preparation area

Essentials:

- Low cost
- Allows for water to flow on hands, i.e., no dipping
- Inexpensive to produce and distribute
- Easy to use/operate
- Durable
- Able to accommodate various types of soap agents or most prevalent one(s), i.e., not just bar soaps
- Securely holds soap and water to prevent them being stolen
- Capable of being produced locally/regionally
- User strategy for waste water generated from use

Desirables:

- Design solution for handling waste water produced

help remind them and their family to wash their hands with soap. This cue to action is critical in habit formation and will be discussed in the next section.

Enabling products and habit formation

The ultimate objective of handwashing programmes is to instil good habits in the targeted populations. In addition to frequency and consistency of the behaviour in question, habits are characterized by automaticity (Verplanken and Orbell, 2003). Verplanken and Wood (2006) suggest that for a habit to be formed, the behaviour needs to be repeated in a stable context (see Figure 1). In handwashing, this stable context is provided by a sink, or in areas without piped water, a handwashing station or some other enabling product. According to Verplanken and Wood, therefore, a habit may not be formed without this stable context, even if the behaviour repeatedly takes place.

Verplanken and Wood (2006) further suggest that, although a behaviour is initially conscious and intentional, automaticity sets in if it is repeated in a stable context; eventually the behaviour is triggered by environmental cues. This is another reason why enabling products such as handwashing stations may be critical in fostering good habits: they provide cues. A mother exiting a latrine is reminded to wash her hands with soap when she sees a handwashing station. As mentioned earlier, the potential for handwashing stations to serve as a cue to action was detected in the Vietnam design consultancy.

Enabling products such as handwashing stations may be critical in fostering good habits

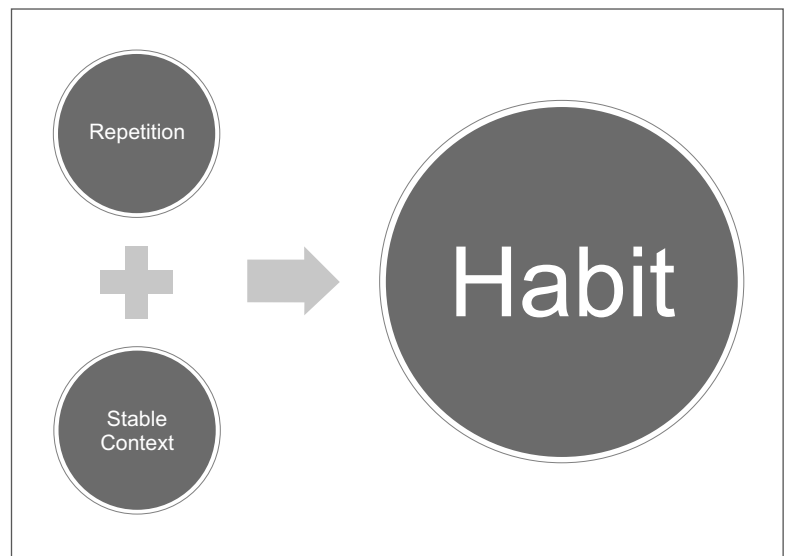


Figure 1. Habit formation (Verplanken and Wood, 2006)

Future prospects: Outlook from the Project

In the final year of the Project's implementation, WSP intends to maximize the integration of these results. For Vietnam, WSP is in discussion with the USAID-funded WaterSHED project on how to bring the handwashing station forward, hopefully toward a manufactured product that would be distributed through commercial and mass-organization channels. In Peru, the Project has partnered with a plastics manufacturer, Duraplast, to produce a dispenser. The dispenser can hold two commonly found 3-litre soft drink bottles, one which the household or school fills with water and the other with a home-made soapy water solution. Distribution is currently through government and non-government organizations though discussions are under way with partners to determine how to further scale up. WSP aims to build in adequate monitoring and evaluation measures to ensure that learning from these initiatives is captured and disseminated.

Conclusion

Factors that influence individuals' opportunity to handwash have often been overlooked in hygiene promotion initiatives, with much of the focus having been on motivational drives through communications. Findings from the Project and other research suggest that convenient access to water and soap when and where needed and having a designated place for HWWS are also important determinants. Programme managers should strongly integrate a component focused on the target population, creating a designated place for handwashing in addition to addressing other critical determinants such as motivation through communications.

Enabling products provide such a designated place. They also provide an environmental cue to action and a stable context for handwashing, factors that literature highlight as critical for habits to form and be maintained.

The landscape of enabling products that WSP recently conducted revealed that many found are tippy-taps or other DIY devices. However, the learning from the Vietnam handwashing station design consultancy is that appearances may matter and that designing features that take into account user preferences and practices is essential. The results from Peru and Vietnam in the next few years as well as planned case studies on selected enabling products will reveal whether mass-produced and commercially distributed products have the potential to scale up and sustain handwashing.

Appearances may matter: designing features that take into account user preferences and practices is essential

Mass-produced and commercially distributed products may have the potential to scale up and sustain handwashing

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