

User Perceptions of Hand Sanitizer in Water-Constrained Communities: A Field Study in Hubli, India

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Good morning everyone. My name is Chris Andersen and I'm a senior majoring in Social Welfare and minoring in Global Poverty and Practice. Sitting here in the audience is my spectacular faculty mentor, Professor Clare Talwalker. Thank you for attending, Professor. It's my pleasure and honor to present to all of you today my research findings from this past summer.

The subject of my research, broadly speaking, is the spread of infectious diseases through the vector of hands in slum communities. Specifically, I've investigated the cultural, social, and economic context of hand sanitizer in the slums of Hubli, India. Before I get started though with the details, let me give you an overview of what I'll be discussing.

I'll begin my talk by introducing the broader health and social problems of diarrhea and respiratory illness that frame this research and make it relevant to efforts to improve health in the developing world. Next, I'll introduce how handwashing attempts to tackle these problems. At this point we'll get to hand sanitizer, the focus of my own research, and a relatively unexplored health intervention in the context of developing countries. To finish setting the stage, we'll move to the methodology of my study. Next, we will come to the more interesting part of my discussion.

We'll consider the findings produced by my research, starting with cultural and individual user preference considerations. We'll then move to the social and economic factors that influenced hand sanitizer use. Lastly, I'll conclude by dis-

Ramlingshwar Nagar, Hubli. Photo Credit: the Author.



cussing the implications of this research on the future of waterless hand hygiene.

As I mentioned, my project was developed as a response to a serious health problem. 570,000 children under the age of five die annually in India from a variety of infectious agents that cause diarrheal and respiratory disease. Proportionally speaking, these deaths account for 33% of all child deaths in India [6]. In the state of Karnataka, where my research site of Hubli is located, 1 in 10 children die before their fifth birthday [9]. If you do the math, that means that 33 in 1000 children in Karnataka will die of these causes. Many of the various diarrhea and pneumonia-causing pathogens can be transmitted by bringing contaminated hands into contact with the mouth [10]. Naturally, we might investigate how people can keep their hands clean so that their health can be improved.

Handwashing has been promoted ubiquitously as a means to prevent disease. Studies have shown that it can be very effective in reducing the incidence of disease. Meta-analyses have estimated that handwashing reduces diarrheal episodes by an average of 31%, and respiratory illness by 21% [1]. Additionally, some scholars have argued that handwashing is the most cost-effective way to prevent a child's death in a developing country [4, 7]. Despite these clear advantages, handwashing is not always an easy behavior to encourage in the context of a developing country. Access to adequate or potable water is often difficult, and soap is sometimes too expensive for slum residents or rural villagers to afford [6]. In Hubli, for example, slum residents have access to piped water for only a few hours every four to eight days [12]. Finally, the uptake of handwashing behavior is also often limited by a number of other factors, including pre-existing habits, social pressures, cultural conceptions of hygiene, and education [5].

In light of the potential difficulties posed by traditional handwashing, it is worthwhile to investigate alternative hand hygiene methods. One such alternative is hand sanitizer. In some ways, hand sanitizer is very similar to handwashing with soap. Research has shown that hand sanitizer is at least as effective at reducing contamination of bacteria and viruses on the hands as handwashing with soap [2, 10]. Another study has shown that regular hand sanitizer use translates into reduced diarrheal episodes in poor communities in Bangladesh [8]. Hand sanitizer also has several benefits when compared to handwashing with soap and water. It does not require water, it requires less time to cleanse the hands, and does not require drying of the hands [11].

At this point, we're going to leave the realm of what is already known about hand hygiene and begin to ask some questions that as yet are unanswered by the existing research. My inquiry began with the question: if hand sanitizer were available to a slum community, either via a non-government organization health intervention or through the market, would poor populations in developing countries actually use it? For what reasons would they use it? Might there be certain factors that could catalyze or constrain the use of hand sanitizer? These factors would ultimately influence whether any sanitizer-related intervention is sustainable, and therefore able to reduce the burden of disease. I set out then to discover what cultural, social, and economic factors I could.

Before I explain what findings my research produced, let me briefly famil-

iarize you with the methodology and location of the study. I employed social science research methods, including six focus group interviews, 40 survey questionnaires, and seven in-depth interviews in order to gain a qualitative sense of what factors would influence hand sanitizer use. All of the questionnaire participants were given the opportunity to use hand sanitizer in their own homes for one week before they responded to the questionnaire. I was also assisted by four research assistants who are locals of Hubli. All of them had previous experience working on a handwashing campaign with a local non-governmental organization, Haath Mein Sehat. The study took place in two slum communities of Hubli. The first is Ramlingeshwar Nagar, which is an outlying region of the city. The second is Maratha Galli, which is downtown near the main marketplace and bus stand. Both of these locations receive piped water for only a few hours every eight days.

Now that we understand the background, methodology, and local context of my study, I will discuss the actual findings of my project. We'll begin with the cultural factors that would seem to influence hand sanitizer use. The first concern that usually arose was the way that hand sanitizer interfaced with common eating practices. In South Asia, a large portion of the population eats their meals with their hands. This, of course, entails a lot of hand-to-mouth contact. It is therefore possible that the residual alcoholic taste or smell left on the hands after hand sanitizer use might make it less appealing to some. In point of fact, complaints regarding the smell of the sanitizer and the way that affected the taste of their food were the most common concern among participants. However, this concern was far from universal. One participant explained that this was not an issue for her, saying "if we use hand sanitizer, after five minutes the taste will not change." Many reported that they actually liked the aroma of hand sanitizer. Most user participants also reported using sanitizer before meals more frequently than any other time.

What conclusions might we draw from this information? First of all, a health intervention that negatively affects the ritual experience of eating is unlikely to be sustainably adopted by the intervention population. From the data, we see that odor and taste are in fact a chief concern. However, there was variation among individual preferences, and some participants actually liked the aroma of the sanitizer, meaning that this concern should not be generalized across the entire population. More market research should be done on what aromas are most appealing, as well as how to develop a sanitizer product that leaves no residual taste on the hands.

A second concern presented by the focus groups was how religious traditions might influence ideas about the importance of water in hygiene behaviors. In both Hinduism and Islam, water carries strong religious connotations. The removal of spiritual impurities is often equated to cleansing with water [3]. Some focus group participants speculated that certain people might not be interested in using sanitizer to disinfect their hands because it would not produce the same sense of cleanliness that water evokes for them. They emphasized the importance of this issue due to the religious importance of water and cleansing. However, when our research team probed participants about their own motiva-

tions for using hand sanitizer, none of the participants directly cited religious reasons as a deterrent. However, many stated that they would rinse their hands first with water, and then use hand sanitizer afterward. It would seem then that the use of water in hand hygiene was still of importance for these individuals, although we could not directly link this use to religiously based notions. Some participants claimed that others, such as residents of isolated villages, would be more reluctant to use a replacement for water due to their conservative religiosity. Moving forward, we might conclude that although the influence of religion on perceptions of water is subtle, it still carries some weight, and merits deeper investigation. For this reason, hand sanitizer may have difficulty being accepted as an alternative to soap and water.

Another area identified by the literature on hygiene among South Asian groups suggests that cleaning practices post-defecation influence hand hygiene practices. Many people in South Asia clean themselves with their left hand after defecation. Therefore, it may feel uncomfortable for them to use a waterless hand cleaning product immediately afterward. My research supported this argument, showing that slum community residents reported using sanitizer after the toilet much less frequently than before eating. 18 of the 37 households that tried sanitizer in their homes for one week indicated that sanitizer was rarely or never used after the toilet, whereas nearly all participants indicated that they used sanitizer before eating. Although immediately after defecation is one of the most important times to ensure good hand hygiene to prevent disease transmission, hand sanitizer does not appear to be an effective method of hygiene behavior given this practice of self-cleaning.

I will now move from a discussion of cultural factors to social and economic factors that influence user perceptions of hand sanitizer. I will begin with family structure. Many families in slum communities are multi-generational. In these families, elders are greatly respected, and at times they are the final decision makers in the home. Early on in our study, some of our respondents hypothesized that if the elders, for whatever reason, strongly disapproved of the use of hand sanitizer in the home, they might prevent other members of the family from using sanitizer as well. Some of the participants who had a trial period with hand sanitizer in their own homes did indicate that their elders were resistant to its use. They claimed, "my elders didn't take [hand sanitizer] because they feel that water and soap is a good way to stay clean." Elders may therefore be a difficult population to target for the uptake of hand sanitizer use. However, none of the participants indicated that these elders had directly influenced whether other members of the family used sanitizer. From a health perspective, older adults are not affected by diarrhea and respiratory illness to the same extent as children. However, elders are often caretakers of young children, so contamination on their hands can affect the health of their children. More research is needed to understand whether uptake of sanitizer can be encouraged among elders specifically.

The next subject I will address is education. Many slum community residents, particularly women, have received little to no education. As such, we expected many residents to be unaware of the health risks of contaminated

hands, and therefore that they would not understand the purpose and usefulness of hand sanitizer as a health promoting agent. When we conducted our questionnaires, some participants confirmed this expectation, indicating that they did not believe that washing hands with soap and water could prevent disease. In addition, most participants had never heard of hand sanitizer before. Nearly all participants required a brief explanation of the purpose of hand sanitizer, and of the key times to use it. From this we might conclude that basic education on germ theory and the benefits of hand sanitizer is necessary for many participants to understand the product. Some participants suggested that education about hand sanitizer would be critical in order to spread its use among the population. One participant said to our research team, “How you explained it to us, if you explain it to them I think they might use [hand sanitizer].” Otherwise, without an understanding of why sanitizer works and when to use it, it is possible that the product will be used incorrectly or not at all.

Hand hygiene remains a health priority in developing countries. Photo Credit: the Author.



The final factor I will address today is poverty. The populations at the highest risk of disease are also the populations with the smallest incomes. It is therefore clear they will be unlikely to afford hand sanitizer. Hand sanitizer is currently sold on the market at 1 Rs per 1 mL. Participants reported that they were willing to pay on average a reduced price of $\frac{1}{3}$ Rs for 1 mL, with lower income participants generally reporting they were willing to pay even less. To give a sense of scale, many slum households make 100 Rs per day or less. Some participants indicated that spending money on hand sanitizer is a low priority when they are trying instead to have enough food or pay for other, more urgent, medical needs. To paraphrase what a slum resident once told me, “Many people in this community have only enough to eat once a day. With this kind of poverty, how can they spend money on medicines?” We might conclude then that if sanitizer were distributed via the market, it would be unlikely to penetrate into the lowest economic groups at risk of disease.

We can draw several general conclusions from this research. First, cultural practices such as eating with hands, hygiene habits, and religion are important factors to consider when introducing hand sanitizer among South Asian groups. Some of the concerns raised by participants, such as the aroma, can be mitigated by using different perfumes and non-alcoholic sanitizers. Other concerns, such as cleaning practices post-defecation and religiously based notions of cleanliness, are more deep-seated and seem to conflict inherently with the design of hand sanitizer. It is also important to target certain groups to encourage sanitizer use, particularly the elderly. Education programs in general must also be supported.

Finally, sanitizer must be available at a drastically lower market price if it is going to reach the populations most affected by disease. Hand sanitizer was, in general, received well by the study population. However, the factors I've just discussed may present significant barriers to the use of this product. Bearing these considerations in mind, hand sanitizer has some potential to be a disease reducing intervention in South Asian slums if it is delivered in a culturally, socially, and economically sensitive manner.

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