

How to change and sustain hygiene behaviours: research in India

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This paper investigates whether a hygiene intervention within community-based sanitation and water projects has an impact on behaviours that are measured many years (1 to 9 years) after the projects have ended. It further seeks to identify which elements of the interventions appear to be most effective for creating sustained behavioural change. An analysis is made of data from a cross-sectional study carried out in Kerala, southern India in 10 communities. The results show that the overall intervention, and in particular, the hygiene/sanitation classes are significantly associated several project outcomes such as handwashing practice of women, knowledge of the need for washing hands after defecation for health reasons, cleanliness of the household environment. No significant linkages were found between project variables and the handwashing and latrine practices of men which appears to reflect the fact that hygiene education activities were more oriented to women than men in the interventions. Other variables were tested such as the number of years since the project had ended in a community, improved access to water and the length of the intervention. None of these were significantly associated with the hygiene behaviours studied. .

Introduction

From 2000 through 2003, the Socio-Economics Units Foundation (SEUF), a non-governmental organization, carried out a 3-year research study together with partner organizations in 6 other countries. The research yielded a rich data set which, in this paper, is analyzed to examine the effectiveness of programme design. In other words, we seek evidence about whether a hygiene intervention had a sustained impact and which particular activities appear more effective at stimulating and sustaining behavioural change. Identifying the effective aspects of a hygiene intervention also implies the need to focus on whether hygiene behaviours were created and sustained.

This study was undertaken in Kerala, southern India. The project had originally been designed and executed by the Socio-Economic Units Foundation (SEUF) within the context of a water and sanitation project supported by the governments of the Netherlands and Denmark. The project included provision of piped water, implemented by the Kerala Water Authority in densely populated rural areas. The SEUF was responsible for the sanitation and hygiene components of the project which were carried out from 1989 through 2000 in about 40 communities (called panchayats), each having populations ranging from about 18,000 to 35,000 people.

Characteristics of the original intervention

The intervention in each community was undertaken by the SEUF together with local government. This was a people-centered programme whose strategy was based on a high level

of participation and joint planning with many community groups, line departments and the local government. The goals of the programme in each community were to provide well-used and maintained latrines for at least half the population below the poverty line as well as hygiene and sanitation promotion for the entire community. As the communities are large and population densities range from about 800 up to 3000 people per square kilometer, the programme was carried out in roughly two neighbourhoods (called wards with approximately 500 households) at a time. When the programme in these wards was approaching completion it was then rolled over to the next two or three wards in the community. The duration of the sanitation interventions was anywhere from 1 to 7 years, determined by the time it took to mobilize the community and attain the goals of the programme.

The intervention was carried out in a medium-term campaign style during which demand was created for latrines, payments were collected from households and local government, construction took place and hygiene education/promotion was carried out. The programme overall and the hygiene activities in particular placed a high priority on the participation of women in many roles. During the period of a programme in a ward and community, the following activities that had hygiene education or promotion contents often took place:

- Training: of community groups such as water committees, elected members of local government, women's and youth groups, local masons, line officers including teachers, pre-school workers, clinic personnel.
- Three required classes for latrine beneficiary households,

one of which was devoted to hygiene. Additional hygiene education classes were occasionally held for women in the neighbourhood.

- Many home visits which were usually related to the execution of the latrine programme but could also include some hygiene focus.
- Mass activities for mobilization and promotion of sanitation or hygiene such as video showings, street drama, exhibitions, competitions, parades by school children.

One field worker was responsible for one or two communities and lived in the community during the project period. However many of the hygiene activities were either organized by or conducted together with the local government, water committees or other community members.

There was variation in the design and implementation of the programme; however, overall this would be considered a medium to high intensity hygiene promotion/education effort.

Conduct of the research study

The study was undertaken in 2 neighbourhoods of communities where the project had ended 1 up to 9 years before the data collection. There were two surveys, one in 2001 and the second in 2002. This report deals largely with the second survey. In this, 10 communities were selected. These were selected to represent the range of situations in the project: different socio-economic status, length and intensity of interventions, differing water situations and time elapsed since the interventions had ended (see Figure 1).

Within each ward, households were selected at random from a list of the project beneficiaries that was made available to the local government. Ten communities were sampled, 20 wards in all. In each of 9 communities a sample of 25 households considered to be below the poverty line was taken. In one community that appeared in both the 2001 and 2002 surveys, a sample of 120 households was taken. This gave a total of 345 households for the 2002 survey. Each household possessed a latrine.

In addition to a household questionnaire, interviews were held with the past and present elected presidents of the communities as well as members of the ward water committees who were active during the period of the project. The staff of the SEUF also provided information.

Methodology

This analysis of the data focuses on seeking evidence about whether the intervention had an impact and which hygiene promotion activities appear more effective at stimulating and sustaining behavioural change.

We approached this from three points of view:

1. The basic effectiveness of the project intervention should be established. In other words: Is there evidence that the project did lead to behavioural change?
2. If the hygiene promotion/education intervention did NOT have an impact on behaviours, then it is expected that

hygiene behaviours will be strongly related to certain other external variables. The external variables selected were: years elapsed since the end of the project intervention, socioeconomic status of the community and access to water.

3. If particular hygiene activities DID lead to sustained behavioural change, then we would expect these activities to be significantly associated with hygiene behaviours after the projects have ended (that is, 1 to 9 years later). If this association exists, then we concluded that this provides evidence of the impact of those activities in promoting and sustaining behavioural change. For example, people who participated in certain project activities would be expected to have better hygiene behaviours than people who did not participate or could not even remember these activities.

Behaviours studied and survey tools

The study focused on hygiene behaviours that are considered to have a significant health impact according to the WHO and were in the project intervention (WHO, 1992). These are:

Handwashing:

- Knowledge of the importance, for health reasons, of handwashing after defecation.
- Skills in handwashing (defined as washing both hands with soap and water) as shown during a demonstration by one member of the family in the household
- Actual handwashing practice measured by pocket voting within the household.

Use and maintenance of latrines

- Latrine correctly constructed and clean, measured by observations of the latrine
- Consistent latrine use when the person is around the household as measured by pocket voting within the household.

Household environment

This was measured by observations of the household compound. The variable was defined as a compound free from visible fecal matter and garbage.

The household pocket voting, a tool for assessing actual hygiene practice, was developed specifically for this study. It was carried out by asking each person present at home to indicate their normal handwashing practice and latrine use when at home, by placing voting papers into labelled pockets attached to a photograph. The photographs showed different handwashing behaviours or toilet areas/technologies and were explained by the field worker. The "votes" were cast inside the house while the field workers were observing the condition of the household environment and latrine, so that the voting was not observed. However, men, women and children used voting slips of different colours, so that their votes could be distinguished at the count which was done outside the household.

In addition to measuring indicators of behavior, questions

were asked in the household about activities in the original intervention. Similar questions were asked during discussions with the informants (community presidents and wart water committee members active at the time of the intervention)

Results

The overall results, aggregated, show that:

- 91.3% (315/345) knew about the importance of handwashing after defecation
- 81.2% (280/345) households had good handwashing skills as shown by the demonstration (washing both hands with soap and water in the home)
- 59.2% (516/872) of the people recorded consistent handwashing of both hands with soap and water when around the home. This was measured by the pocket voting.

These findings are in the expected direction, with knowledge being greater than skills which, in turn, was greater than reported practice.

The gender difference in handwashing was significant. This means that 71.2% (297 out of 417) of the women voting in the household) reported consistent handwashing practice versus 48.1% (219/455) of the men ($p=0.0006$, $OR=1.48$, $CI\ 1.18-1.85$).

Consistent latrine use was reported by 78.1% (697/892) of the men and women who voted. Latrine use was 93.9% for women (461 out of 491) and 58.9% for men (236 out of 401). The difference between practices of men and women in latrine use when at home is also significant: $p=0.0001$, $OR=1.60$, $CI\ 1.29-1.97$.

Impact of the interventions

The purpose of this analysis is to study which hygiene promotion activities may have an impact on sustained behaviours. However, to do this it is first necessary to find evidence that the project intervention did have an impact on behaviours. This is illustrated in two ways.

First, the coverage with hygienic latrines increased in each community from between 32% to 62% during the project interventions (see figure 1). The survey showed that the latrines appear to be clean (latrine superstructure and pan free from fecal matter or urine splashes) in 90.4% (312/345) of the households. This indicates many households have and continue to maintain latrines, implying a change in behaviour from the beginning to the end of the project intervention.

Secondly, during the first survey differences in hygiene behaviour were compared between a control community (105 households) and an intervention community (120 households). There were significant differences, implying that the intervention had an impact. Specifically:

- good handwashing skills were demonstrated in the intervention community (97%) versus 10% in the control community
- Reported consistent handwashing practice after defecation was 86% in the intervention community versus 6% in the control community.

- Soap and water were conveniently located for handwashing in 93% of the intervention households versus 0% (none) of the control households.

Impact of independent variables

If specific hygiene promotion and education activities did NOT cause sustained behavioural change, then we would expect that some other external variables would surface. Thus, we assume that if the hygiene intervention is NOT associated with sustained behavioural change, then the hygiene behaviours would be associated to certain other variables. The variables we selected were: the time elapsed since the projects ended, the socio-economic status of the communities and improved access to water independent of the hygiene intervention. The data was analysed by calculating linear trends stratified by community.

Time elapsed since projected ended

The frequency of hygiene behaviours was compared among communities where the projects ended in different years (1 to 9 years before the survey, 1993 to 2000). For men, the change in male latrine use and handwashing was not significant (See Figure 2).

For women the trend in both lines is significant. This means that women, where the time elapsed since the end of the project was shorter were significantly more likely to wash both hands with soap and water ($X^2=8.28\ p=0.004$) and were significantly more like to use the latrine when at home ($X^2=14.67\ p=0.00013$). In other words, handwashing and latrine use practice seem to deteriorate as the years go by after the project ends.

However, the decrease is not very great. Even for projects that ended 9 years before this survey, in 1993, about 80% (that is, 4 out of 5) of the women were reportedly still consistently using their latrines. For these reasons we can still say that latrine use was fairly well sustained for both men and women.

Access to water

Improved access to water was considered, in the survey, to mean that water sources are located within 100 steps from the household. Water supply is good in Kerala and thus, only 16.5% (57/345) households were located further than 100 steps from a water point. However these households did not show significantly different hygiene behaviours from the households with water sources very nearby. The data was stratified by community in this calculation to exclude confounding variables. It is interesting to note that in the 5 other countries where the study was carried out of sustainability of hygiene behaviours, improved access to water supply was also not associated with the key hygiene behaviours. For us, this implies that construction is insufficient to create or sustain new hygiene practices.

Socio-economic status of communities

The socio-economic level of the community was not asso-

ciated with the handwashing practices of men and women or the use of latrines by women. However, use of latrines by men was linked to the social and economic status of the community, implying that men from richer communities tended to use latrines more consistently ($r^2 = 0.85$).

Specific exposure to hygiene promotion and education

There were 10 activities or project elements measured representing exposure to hygiene promotion and education. The data was analysed to see which, if any, of these is associated with hygiene behaviours 1 to 9 years after the projects have ended.

People were asked to mention activities carried out during the sanitation campaign. Those elements of the project that were mentioned by more than one-fourth of the households were:

- required classes: 81.7% of 345 households mentioned the sanitation/hygiene classes, probably because they or someone in the household attended.
- seeing videos (27.5% of 345 households),
- Most of the households (88.2% out of 345) remembered that women were involved in organizing some of the sanitation campaign activities.
- masons who were building the latrines gave hygiene messages and this was remembered by 53% or 185/345 of the households).
- More than one third of the households (34.2%) reported having more than 5 home visits, although it should be noted that the main purposes of these were not hygiene promotion, but other things such as beneficiary selection, collection of money and managing construction.

The statistical calculations (2x2 tables) comparing hygiene activities with behaviours were stratified by community to limit confounding with other variables. Of all ten hygiene elements in the project, the classes were related to women's behaviours. Remembering these classes was positively associated with handwashing reported by women (OR 2.04, CI 1.05-3.96) as well as knowing that washing hands before eating is important for health reasons (OR 2.9, CI 1.43-6.0) and the cleanliness of household surroundings which were free of faeces and other waste for which women are responsible (OR 2.8, CI 1.22-6.6). There was a tendency for remembering the hygiene classes to be associated with women's latrine use ($p=0.067$, OR 2.34, .99-6.37). Interestingly, there was no relation between the specific project variables and the reported hygiene behaviours of men.

Campaign

Eight of the recalled measures of exposure to the intervention (household women's participation, classes, video/slide shows, drama, competitions, women involved in organization, masons giving messages, and the number of home visits) showed a positive association with handwashing reported by the women of the household, although only one of these, the health education classes, was statistically significant. That these associations are all in the expected direction is itself significant; the probability of it arising by chance is 2-8 =

0.004 (Cairncross, 2004). Handwashing by men, however, did not show any significant or consistent association with any measure of exposure to the intervention.

Discussion

We are able to test whether and what elements of a hygiene intervention seemed to have an impact.

Evidence of impact was shown by increased latrine ownership, of latrines which appear to be well maintained. Secondly it was shown in comparisons with a control community. The intervention community performed significantly better than the control community for three measures of handwashing (handwashing skills, handwashing practice, location of soap and water convenient for handwashing). These findings fit well with other research showing that hygiene promotion has an impact on behaviours (Kanki, 2004).

We eliminated some variables that would detract from our hypothesis that specific hygiene activities are associated with sustained behavioural change. The end date of the project ended, that is, the possible deterioration in behaviours over time, did not seem important (see Figure 2)

The length of the intervention was not associated with current behaviours. The length of the project was, in fact, determined by how long it took the NGO and local government to carry out the project according to plan, to achieve its goals. This is interesting as it also implies that rather than pre-determining the length of hygiene interventions, it may be more effective to continue the intervention until its objectives are achieved.

Overall, the intervention activities seemed to have an impact. And specifically the most structured activity--- classes where attendance was required by at least one person in the household in order to get a latrine subsidy and have a good latrine constructed..

It was somewhat surprising to see that the home visits during the project were not significantly associated with sustained hygiene behaviours measured after the project intervention. However, in retrospect, it appears that the primary function of the home visits related to project implementation issues such as sanitation construction, beneficiary selection, collection of contributions, rather than hygiene.

Gender aspects

The project had a certain focus on women. Women held positions on the important ward water committee and were usually the ones who attended the required hygiene classes. The men, as project staff report, were more involved in the construction aspects.

Handwashing and latrine practices of men are significantly lower than those of women. Furthermore, the handwashing practices and latrine use by men were not associated with the project interventions, overall. The latrine use by men was positively associated with the socio-economic level of the communities. Thus, it appears that the project intervention did not emphasize hygiene promotion for men, and the results are that practice is lower.

It had been assumed that if the women, who in the state of

Communities	Kadap	Anju	Neen	Alap	Kadak	Puth	Koippu	Marr	Kaipa	East Kall
SES status of community	1	0	2	2	3	2	5	4	3	5
Intervention end date	1996	1993	1998	2000	1995	1995	1995	2000	1993	1998
Duration of intervention (yrs)	1	5	2	4	3	3	3	5	7	4
initial sanitation coverage (%)	15	39	18	32	43	41	24	55	52	38
final sanitation coverage (%)	41	72	55	87	75	87	71	85	72	100
latrine use women (%)	68	72	81	85	92	97	99	100	100	100
latrine use men (%)	48	88	59	60	85	69	76	100	100	96
handwashing women %	22	13	45	48	68	38	82	69	75	84
handwashing men %	16	10	32	40	42	38	58	44	56	77

NOTE 1: SES (socio-economic status of the community is a relative rating from 0 (lowest) to 5 (highest).

NOTE 2: Another government-managed project, called the People's People Participation programme, using the same methodology for sanitation as the SEUF programme took place after the SEUF programme in a few communities. This is also included in the "duration of intervention" calculation.

Figure 1. Data on 10 communities in the SEUF 2002 hygiene behaviours survey, Kerala, India

* Source: Zacharia, 2003

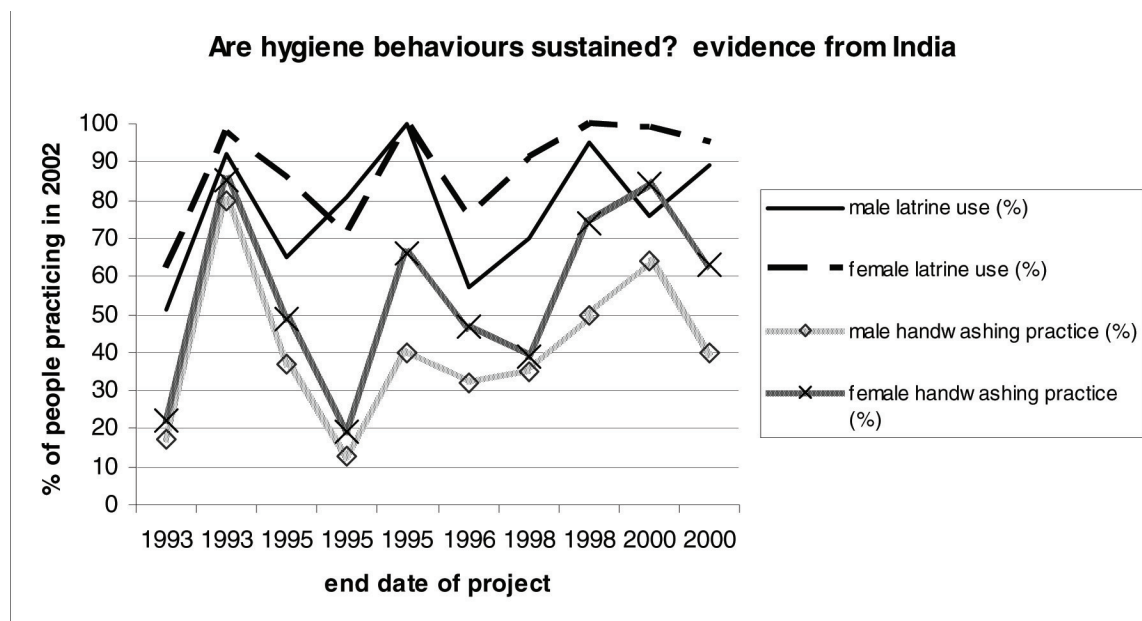


Figure 2. Consistent handwashing and latrine use in 10 communities by end dates of projects, Kerala, India

* Source: Shordt, 2004

Kerala, play a relatively strong role in the home and family, developed consistent behaviours, then this would carry over to the men. This does not appear to be the case. What we see in hindsight is that in an otherwise effective hygiene promotion intervention within a water and sanitation programme, the men should have been targeted equally (or even more) with the women for improving hygiene behaviours. The lesson learned is that hygiene interventions need to be formulated from a gender perspective with a focus on men as well as women.

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