Projecting Health:
Community-Led Video Education for Maternal Health

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ABSTRACT

We present a qualitative study of Projecting Health, a public health project we deployed in rural Uttar Pradesh (India) to address persistently high maternal and infant mortality rates. This project is based on our model of Community-led Video Education (CVE), which leverages community resources for the generation, dissemination, and assimilation of visual media. We use the lens of information flows to examine how our instantiation of CVE enables the translation of globally approved health care norms to local household practices. We also demonstrate how CVE allows for integration with current community practices, existing state-supported health care infrastructure, social and patriarchal structures, and power dynamics within our target populations to drive community participation.

Categories and Subject Descriptors

K.3 [**Computing Milieux**]: Computer Uses in Education

General Terms

Human Factors

Keywords

Maternal and child health; behavior change; community; video-based instruction.

1. INTRODUCTION

Maternal and infant mortality rates in numerous developing countries are persistently high. Addressing these became a global priority with the introduction of the Millennium Development Goals [29]. The problem is multi-faceted and solutions lie in various domains, including the provision of better nutrition, improved health services, innovative technologies for infant care, among others. We aim to address this problem by providing relevant and necessary

information to new and expecting mothers so they are better equipped to care for their and their babies' health. This includes teaching them the importance of exclusive breastfeeding as opposed to feeding the baby goat's milk or honey right after birth, institutional deliveries where complications can be better dealt with, and family planning methods that are not very widely understood, among other topics.

To ensure that the above messages are disseminated effectively and appropriately, we use the model of *Community-led Video Education* (CVE) that we have adapted, based on the success of Digital Green's video-based approach for agricultural education [11]. In CVE, high-quality short instructional films are created locally and presented in facilitated dissemination sessions. Deploying CVE in low-resource environments such as those we target is made feasible by the advent of low-cost technologies such as digital camcorders, portable video projectors, and free video-editing software.

Projecting Health is our instantiation of CVE in 84 villages in the north Indian state of Uttar Pradesh (UP), that targets maternal and newborn health by providing information on topics such as birth preparedness, thermal care, breastfeeding, family planning, among others. Our deployment has lasted 24 months, in which 38 short films have been produced and 4,545 group disseminations have taken place. In this paper, we describe our CVE model in detail to explain how the films are produced, disseminated, and assimilated, highlighting the level of community participation through these processes. We use the lens of information flows to frame our findings and study the translation of globally approved health care norms to local household practices *for* and *by* the community, as enabled by CVE. We also demonstrate how CVE allows for integration with current community practices, existing state-supported health care infrastructure, social and patriarchal structures, and power dynamics within our target populations.

We begin by providing a background of the context in which we situate our work. In section 3, we present the details of our two year long Projecting Health deployment. We present our findings in Section 4, organizing them to illustrate the different stages of information flow - from production to dissemination to assimilation, feeding back to the creation process. We conclude in section 5, summarizing our contributions and sharing the lessons we have learned.

2. BACKGROUND

We now present background information regarding the problem of maternal and infant mortality that we address

with Projecting Health, the origins of CVE, and prior research that we build on with this paper.

2.1 Maternal and Child Health

The Millennium Development Goals instituted by the UN put forth the global challenge of reducing maternal deaths by three-quarters and child deaths by two-thirds between 1990 and 2015 [29]. Key indicators are the under-five mortality rate, measured in deaths per 1000 children between birth and five years of age, and maternal mortality measured in deaths per 100,000. In spite of the progress in reducing mortality rates, the rates for developing and developed countries are still drastically different. For example, Germany has a maternal mortality rate of 7 and an under-five mortality rate rate of 4. In developing countries, maternal mortality can be as high as 1100 and under-five mortality as high as 167 [28]. India's maternal mortality rate is 190, ranging by state from 66 to 328. In UP, the maternal mortality rate is 292. The under-five mortality in India is 53, ranging from 13 to 75 by state, where UP stands at 68 [13].

Global health research has identified specific interventions with proven efficacy to reduce mortality rates [7]. These include medical actions to directly save lives such as infant resuscitation or haemorrhage management and preventative measures such as tetanus toxoid immunization, breastfeeding, and others. The preventative measures can be very effective, with packages of these interventions being shown to reduce mortality by more than 50% [17]. The adoption of these measures depends critically on public acceptance, so that behavior change becomes a core concern.

There are many theories of behavior change that seek to understand how health messaging can lead to long-term changes in practices. In the design of Projecting Health, we drew inspiration from Kumar et al.'s [16] approach. They focus (like us) on newborn survival. Their work is also situated in rural UP, within 100 km of our field sites. They suggest that for behavior change relating to newborn-care, the household must be targeted because it is the locus of behavior action. They also highlight that existing behaviors are strongly rooted in culture and tradition, arising from insufficient knowledge of more scientifically informed practices. We build on their extensive research and depth of understanding with our CVE model, which we discuss next.

2.2 Community-led Video Education (CVE)

The origins of CVE can be traced to Tutored Videotape Instruction (TVI) that was invented by James Gibbons at Stanford University in the 1970s [12]. In TVI, video lectures were shown to a group of students by a peer-facilitator who was also responsible for managing the discussion. This approach demonstrated the benefits of facilitated video viewing in contrast to passive viewing. Gibbons showed that students taking TVI courses performed significantly better than those using other forms of video-based learning.

In 2004, Randy Wang's Digital Study Hall (DSH) project adapted TVI for primary school education in rural India [27]. In DSH, video recordings of lessons at public schools were used by teachers in less-equipped rural schools. The key contributions of DSH included a methodology for centralized packaging of content appropriate for rural schools, contributing a video production and dissemination workflow, with a focus on "cost-realism".

In 2007, Digital Green adapted Wang's approach for the agricultural domain, making necessary structural changes to accommodate farmers' groups instead of children and teachers [11, 14]. One of its major contributions was a decentralized, localized video creation process. Local content made farmers more responsive and elicited greater participation from the community. An evaluation study compared promoting particular agriculture practices using facilitated videos to the traditional approach of employing extension agents to visit farmers. Results showed that the video-based approach was seven times more effective in promoting adoption of agriculture practices (measured according to cost per adoption) [11]. One technological innovation that has been significant to Digital Green and other (non-research) deployments of this approach is the pico projector, a portable and low-cost battery-powered projector. One Media Player per Trainer (www.ompt.org) introduced this to Digital Green in 2009, before we integrated it into our model in 2012.

The CVE model that we develop is different from prior approaches not only because it targets the health care domain, but also because it seeks a deeper integration with existing community practices and structures. The videos in our model are relatively high-quality films with a legitimate storyline, relying on considerable community participation and minimal 'top-down' intervention for their production.

2.3 Related Work

We now present a summary of recent research initiatives in ICTD that target low-resource environments for dissemination of locally relevant content. Frohlich et al. [10], Reitmaier et al. [26], and Bidwell et al. [2] have studied local mobile audio and video content creation for digital storytelling in rural communities of South India, Kenya, and South Africa. Ladeira and Cutrell [18] highlight the instructional value of digital storytelling that combines motivational content with narrative framing. Much of this work is motivated by the desire to reduce text dependence and increase audience engagement in communities with consistently low literacy rates. For example, Cuendet et al. [6] developed VideoKheti, a mobile interface that uses speech, graphics, and touch to help farmers locate and watch agricultural extension videos in their own dialects.

Prior research that examines the use of technology for maternal health in low-resource regions has attempted to capitalize on the wide penetration and usability of mobile technology in these settings. For example, Ramachandran et al. [24] experimented with the creation of short *ad hoc* videos by health workers using mobile phones to persuade village women and attract them towards utilizing state-provided health services. A related study also examined phone-based messaging between health workers and village women [25]. Fiore-Silfvast et al. [9] studied the use of mobile videos by midwives for patient education during postnatal care examinations. Molapo and Marsden [22] designed a tool to aid rural health trainers in creating instructional videos for training low-literate Community Health Workers in Lesotho. Mathur et al. [19] explored the feasibility of creating and presenting digital content using mobile phones and pico projectors. Our work builds on and extends this body of work by highlighting best practices for video creation and dissemination based on our two year long deployment. First, we invest significantly in the process of production, ensuring that our films are engaging and aligned with the kind of entertainment the audience desires. Second, we go beyond

examining the feasibility of using different technologies and describe how these can be integrated into and leverage existing community workflows for filming and dissemination.

Our goal through CVE is to elicit community participation at every level of Projecting Health - from idea formulation to dissemination and beyond, where information translates into community practices. Several development-oriented research projects in recent years have made the community the focus of their efforts [10, 2, 11]. We turn to Bailur's research on participative processes in rural information systems [1] that deconstructs the notion of participation for framing our work. We target the 'strong participation' that Chambers' idea of participatory rural appraisal [5] represents, as explained by Michener [20] and Brett [3] in their discussion of the strong-weak participation spectrum. This implies *"an educational and empowering process in which people, in partnership with each other and those able to assist them, identify problems and needs, mobilise resources, and assume responsibility themselves to plan, manage, control and assess the individual and collective actions that they themselves decide upon"* [4].

3. RESEARCH DESIGN

We now discuss our two year long IRB-approved research study, beginning with a description of our field sites, our implementation as designed, and our research methodology.

3.1 Field Sites

The project is set in UP, the most populous Indian state (with nearly 200 million people as of 2011). UP lags much of the rest of India in health and development indicators. Maternal and infant mortality rates are high as mentioned. Female literacy stands at 59.26% in UP versus 65.46% in India overall. Projecting Health was implemented in three blocks within the Raebareli district of UP - Bachhrawan, Khiro, and Sareni. These sites are largely rural, and were identified as target sites because of their demographics and the presence of reliable field partner organizations, known to the Projecting Health team from a previous undertaking.

3.2 Project Implementation

The community-based organizations we partnered with - Gram Vikas Sansthan (GVS) and Nehru Yuva Sangathan Tisi (NYST) - have a long history of working with local communities to support development projects. Projecting Health was implemented in partnership with them, a global health NGO, a US research institution, and an Indian NGO working in the agriculture domain. The project was first implemented in October 2012 by GVS in 27 villages of the Bachhrawan block. Given the community's positive response, we expanded it to the Khiro and Sareni blocks (targeting a total of 57 villages) in July 2013, under NYST's charge. In Bachhrawan, 55 ASHAs serve a population of approximately 50,000 and 81 ASHAs serve populations of approximately 41,000 in each of Khiro and Sareni. The screenings are attended by 14-17 women on average, across blocks. Bachhrawan has completed 94% of its targeted screenings (of approx. 2,100) while Khiro and Sareni have completed 99% of their targeted screenings (of approx. 2400). We now describe the key aspects of our implementation, before presenting our detailed qualitative findings in section 4.

3.2.1 Video Production

The video production process of Projecting Health was designed to present accurate health messaging in a locally digestible form. GVS and NYST recruited staff whom we trained in all aspects of video production, including storyboarding, basic cinematography, and video editing. These activities now take place locally, once the key messages are finalized by a team of domain experts. The video production team creates a storyboard to convey the key message for the behavior being promoted. It then identifies the filming location, recruits actors, and conducts the shooting. The film is edited and reviewed, possibly re-shot in parts and re-reviewed, and finally, distributed for screening. Thirty-eight films have been produced through September 2014. Most of the films address core maternal and child health topics: birth preparedness, breastfeeding, keeping a baby warm, and caring for the umbilical cord. Family planning topics were added more recently. A number of other films were created on topics suggested by the community, such as emergency transportation, institutional deliveries, and immunization. These films are not merely instructional, seeking also to engage and entertain with a rich storyline.

3.2.2 Information Dissemination

In CVE, a facilitator is responsible for screening and discussing a given video. GVS and NYST work closely with the Accredited Social Health Activists (ASHAs) or frontline health workers for facilitating Projecting Health video disseminations. The ASHAs are women from local communities who are appointed by the government to serve as liaisons between the state health system and the village women. They identify and monitor the health of pregnant women, encourage them to seek antenatal care and institutional deliveries, and provide basic health information to their communities. They conduct disseminations at two venues - Mothers' Group meetings that are particular to Projecting Health and Village Health and Nutrition Days (VHNDs) that were introduced by the government. Mothers' Groups are held monthly by ASHAs for the pregnant and lactating women in the community, also welcoming mothers-in-law and other (generally women) family members. VHNDs are also held monthly by other frontline workers and provide immunization, nutrition supplements, and other services to children under five. Here, the ASHA conducts multiple screenings in one day, leading discussions with the women present. Disseminations at these two venues are differently structured, but the ASHA performs her role in the same format.

3.2.3 Community Advisory Board

The Community Advisory Board (CAB) is a unique and essential feature of CVE. It consists of a diverse group of individuals who work together to support the operation and guide the evolution of Projecting Health at various levels. Each block has a CAB that consists of community members who are doctors, government officials, ASHAs, other frontline health workers, staff members, and leaders with a community presence. These CABs promote both accountability and governance of the local implementations of Projecting Health. They meet quarterly to review the project's progress and discuss potential avenues of growth and expansion. In these meetings, frontline health workers get a chance to voice their local communities' requests and senior government officials take these into consideration. Senior CAB members

can also use these meetings to direct the frontline workers if required. The CAB, therefore, plays a critical role in creating the information flows and facilitating the community participation that we study in this paper.

3.3 Methods and Analysis

We used a large combination of methods for collecting data. We conducted surveys to get a quantitative perspective on the demographics of our target populations and their health practices. We logged details of every dissemination. We maintained minutes of all CAB meetings. We observed the operations of the project over a sum total of approximately 15 weeks spent in the field, attending over 30 dissemination sessions. We regularly conducted interviews and focus group sessions in the field with ASHAs, mothers, and the field staff. These also helped in triangulating our data and mitigating the impact of participant response bias - virtually unavoidable in the context of our fieldwork. All video production processes were documented. ASHAs conducted house visits and collected data for assessing whether the practices taught by Projecting Health had been adopted. Not all of this data was useful for our paper[1], but our analysis is influenced by the entirety of the data we collected.

We conducted our data analysis in line with interpretivist approaches [8], with the goal of highlighting two key (and previously understudied) aspects of Projecting Health: the role of community participation in the operation of our project and the manner in which information flows from globally approved health care norms to local household practices. We iteratively coded our field notes, interview transcripts, and archival data to identify emergent themes. In the following section, we draw out aspects of our findings that engage directly with the participation of community actors and the flow of information.

4. FINDINGS

We organize our findings by following the spiraling flow of information from brainstorming of key messages to film production, facilitated dissemination, audience assimilation, and community feedback towards further creation of key messages. In each of these stages, we focus on the key actors who are responsible for taking the information forward. First, it is the project staff involved in storyboarding and filming. Next, the ASHAs project these films to their audiences in the Mothers' Groups. These audience members then assimilate and distribute the information they receive to their households in particular and the community at large. Feedback from the community then fuels the further creation of films. We now describe these stages in detail.

4.1 Creating the Videos

We have observed the shooting of several Projecting Health films. In one of these sessions, Mohit and Shivani[2] - community resource persons in NYST's Khiro block - set up their equipment in the courtyard of a house in Bhitargaon village and engaged onlookers stood by the sides to watch. The filming equipment consisted of a Kodak PlayTouch camera, a remote microphone, an umbrella that was used for adjusting the bright sunlight, and a paper copy of the storyboard.

An ASHA was being filmed, as she stood at the entrance to the house, knocking on the door. A middle-aged lady opened the door, greeting her thus: "Oh, ASHA *bahu* (daughter-in-law), you are here! Come in, come in!" Immediately, Mohit stopped her to point out that she should wait a few seconds before opening the door, so as not to appear as though she knew the ASHA was there. Several takes later, the filming was done. The ASHA had apparently been successful in convincing the mother-in-law that her pregnant daughter-in-law needed urgent attention because she may be going into labor. The mother-in-law had called and told her son this, and he was coming home to take his wife to the health center right away. This film was aimed at impressing upon its viewers the importance and safety of institutional deliveries.

4.1.1 Training Behind the Scenes

Neither Mohit and Shivani, nor any of the other video production staff had any experience with filming before working with Projecting Health. However, Mohit's prior job as a wedding photographer, our training sessions, and sheer practice have made him comfortable with the video creation process. Another member of project staff in Bachhrawan was involved in street theatre earlier. The storyboarding and scripting came to him naturally as a result, he told us. We taught the staff to select filming locales, hold auditions, and recruit actors for the films, a process that now seems quite familiar to them, as we found from our interviews. The training sessions also taught them to convert health messages into storyboards using a prescribed format, use cameras and microphones for filming, and finally, edit video footage (using free-of-cost MS MovieMaker) into a short 7-12 minute film. These sessions focused purely on the mechanics of storyboarding, filming, and video editing. With time, the teams became more experimental and created richer, more elaborate storylines than we had trained them to, with minimal instruction. Below we highlight the ways in which they have appropriated the filmmaking process.

4.1.2 The Art of Filmmaking

The process of crafting the video has been standardized by the GVS and NYST video production teams. Once the CAB identifies the key message, the teams create the storyboard, select the filming locale, and hold auditions to finalize the cast. They invariably integrate an ASHA (and occasionally other senior frontline workers) into the storyline. The films frequently show the ASHA visiting the mother at her house to deliver the key message in the video. Over time, this has brought the villagers to associate ASHAs with the films. For those familiar with the workers but not the films, this association draws them to the films. For those who are willing to trust the films, this association builds credibility for the ASHAs. Moreover, the ASHAs become familiar with the key messages in the film through the filming process, so they can deliver them with greater ease in disseminations. Ramachandran et al. [24] have relatedly discussed the creation and use of videos by ASHAs and the resulting impact on self-efficacy. We extend this work through our use of instructional and 'professional' videos.

The heavily patriarchal structure of this society makes it critical for the men and mothers-in-law in the families to be on board for behavior change to take place, as also discussed by Ramachandran et al. [24]. When and how to include their participation in the storyline has been a serious

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consideration for every film. For instance, the filming above featured a mother-in-law as the responsible family member who managed to get the mother to the hospital in time. The exclusive breastfeeding film also shows a man encounter a breastfeeding awareness campaign and tell his wife about it.

Figure 1: Filming in progress with two ASHAs and a new mother.

Quite often the film includes a song or two, led by a woman playing the *dholak* - a traditional percussion instrument, with several other women seated in a circle and singing along. These songs are developed especially for the films, and the lyrics are designed to convey the key messages, such as this song on exclusive breastfeeding:

> *Breastfeeding Song*
> Use the correct method to feed milk
> Wake up sister, wake up sister, wake up sister
> Give the infant some support, straighten the body
> Get her mouth fixed in position to start feeding
> Wake up sister, wake up sister, wake up sister
> First feed from one side then from the other side
> Feed with love, wake up sister, wake up sister
> Use the right method to feed milk, wake up sister

Apart from giving the songwriters a mode of expression for their art, the songs have been appreciated for a list of reasons. First, songs are an integral part of commercial Indian cinema, and thus had a legitimizing effect on our videos. They also offered an alternate expression of the key messages, as they were sung in folk form and in the local *Awadhi* (Eastern Hindi) dialect, while the main video was in more colloquial Hindi. Another purpose these songs served was to include more people in the film and help the production team satisfy the growing demand for participation within the communities where the filming took place. As one video production team member said:

> "Sometimes someone will want to play a role in the video, but when we audition we find that they are unable to act. . . sometimes they are too shy, sometimes they have trouble with the lines, or sometimes we just have too many people wanting to participate. When this happens, we try to placate them by creating a song scene in the film and allowing them to be in it. That is the most we can do sometimes."

These are a few of the strategies that have been developed by the video production teams largely of their own accord but in consultation with the CAB, as they design their films to *inform* families about various best practices for maternal and newborn health based on the topic of the video, *engage* them by connecting with what they already know and building on it, and *entertain* them by including songs and rich storylines that resonate.

4.1.3 Challenges and Workarounds

Bridging the information gap is not easy. We trained the production teams to storyboard, film, and edit videos, but their responsibilities now include much more than just video production. For example, some topics such as family planning methods or breastfeeding need to be dealt with sensitively on video and the CAB members work with the team to ensure appropriate messaging, using images where needed. There are logistical challenges as well. One production staff member complained lightly:

> "We have a problem. Everyone wants to be in the films, and the village *pradhans* (leaders) are pressurizing us to shoot the films in their villages."

The decision of where to shoot is up to them, but to ensure that other communities do not take offense, they have to manage community expectations with placatory promises and ensure a geographic spread. When they do carry out the filming at a locale, they make an effort to "advertise" the village with distance shots that pan across village landmarks such as a temple, canal, or a signpost with the name of the village. This allows the village residents to relate more positively to the project, increases viewership within the village, and makes other villages keen to be similarly shown on film.

Gaining the expertise to produce these videos has taken time. One problem that came up frequently in early videos was jump cuts - consecutive shots taken from *almost* the same angle leading to a bumpy viewing experience - because the actors would only be able to remember short portions of their dialog at a time. Another frequent concern with early videos was sound quality, due to inadequate adjustment of the microphone. Lighting issues were also common. Several films had to be re-shot to fix these issues. The filming process is now more streamlined. Scenes do occasionally need to be recreated, and it is still burdensome to bring actors together in the same clothes for instance, but the teams are now adept at handling these overheads.

Though our intention was to give the teams easy filming and editing tools, they are now requesting equipment upgrades. Having tested the limits of Moviemaker, they would like more sophisticated tools to make better edits. The camera also seems inadequate to them, since it "doesn't zoom enough". Their desire to experiment in more artistic ways was an unexpected but welcome development for us, though funding better equipment does raise operating costs.

4.2 Projecting and Disseminating

Converting the information to be disseminated into a video must be done in a fashion that is culturally fitting and locally acceptable for behavior change to be possible. Reaching this information to our target audience is a challenge in itself. Since the ASHAs are recruited by the government to reach out to these mothers, it was natural for us to turn to them for assistance, as Ramachandran et al. [24] also found. This

allowed us to embed our initiative into the existing health system for smoother operation and more efficient resource allocation. The ASHAs were able to use our videos as job aids and we benefited from their access to the community

4.2.1 Mothers' Groups

ASHAs screen the Projecting Health videos in Mothers' Group meetings that they organize to discuss the concerns of new and expecting mothers in the communities they are responsible for[3]. These groups are particularly useful in providing access to a forum where women can learn from and support each other. We trained the ASHAs to use low-cost, battery-powered *pico projectors* that could store videos on an inbuilt memory card. We also trained them to facilitate the screening of our videos using these projectors, teaching them when and how to interject with questions to see that their audience understood the key message in the video. To organize a Mothers' Group meeting, the ASHAs' first task is to invite the mothers she is 'in charge of'. She does this by calling them or stopping by their houses to inform them. She procures the pico projector from one of several central locations where the projectors are stored, so that several ASHAs can share each one. We now offer our field notes from a dissemination that we observed. This was conducted by Sunita, an ASHA in Jalalpur village of Bachhrawan block.

We were seated on the floor of one of the two local primary school buildings in Jalalpur when Sunita walked in with her pico projector. Other women had begun to gather as well, and were sitting down a little further from us on the floor while Sunita taped a white plastic sheet to the wall and carefully unpacked the pico from its box. She placed it around six feet from the wall and plugged in a pair of portable speakers she had brought with her. She checked to see if the pico was charged and working. There were around 12 women seated in a semi-circle facing the projector, and a few more trickled in. Some women in the audience were young - visibly pregnant or with babies in tow - and some were old - most likely mothers-in-law with pregnant daughters-in-law. (The staff mentioned that some mothers-in-law come alone, while their daughters-in-law stay at home either because the families are more orthodox, or because they may be close to their due date.) There were also some young children and adolescent girls accompanying the older women.

Sunita started the meeting with a discussion of the previous month's film (on birth preparedness), asked her audience what they recalled from it, and reminded them of the message it conveyed. She then introduced the topic of this month's film - immunization, before picking up the remote and clicking it several times to turn on the projector and locate the right video. She seemed fairly comfortable with using the pico. There was silence in the room once the video began, and the women paid attention to the film. Halfway through, a pair of questions appeared (in Hindi) on the wall. Sunita paused the video, read out the first question, and moderated a discussion to ensure that her audience had understood the answer, before doing the same with the next question. Some of the older women in the audience were more vocal than the younger ones. Sunita then resumed the video and the women were particularly engaged when the actors broke into song. When the film was over, Sunita asked the audience if they wanted a replay.

Figure 2: A Projecting Health dissemination in progress.

They did, so she repeated the video but without stopping for questions. In the end, she invited the audience to ask questions. Women asked a range of questions, including *"If a baby is sick, can she be vaccinated?"* and *"What happens if the vaccine is not administered in time?"* When the Q&A session was over, Sunita wrapped up the meeting with a reminder of the immunization session on the following Saturday, as women slowly got up to leave.

Not all dissemination sessions we observed unfolded as smoothly as the one described above. Sometimes the pico stops working, while at other times it may not be charged[4]. Sometimes there are a lot of questions, such as *"What should I do when the iron tablets cause nausea and vomiting?"* or *"Will sterilization make me fat?"*, we noted, and sometimes there are none. Even the comfort with which Sunita moderated the discussion with the questions on screen has taken time for her to acquire, and there are 136 other ASHAs who have been trained. Attendance also wavers; in summer months, for instance, it is too hot to sit in a large group in a room with closed doors and windows (with no power). Notwithstanding these hurdles, the use of projectors as job aids has significantly eased the burden on the ASHAs to convey necessary and useful health-related information. The format of Mothers' Groups has also been helpful in streamlining the delivery of this information and ensuring that the women can learn from and support each other.

4.2.2 Additional Screenings

Aside from MG meetings, the ASHAs are also responsible for screenings at the monthly VHNDs. Here, the Anganwadi Worker (AWW) manages the immunization and distribution of food supplements, while the ASHA conducts back-to-back (2-3) dissemination sessions with a rotating set of attendees. The attendance is not as consistent at these screenings and the attendees are often different from the women at the MG meetings. Moderating discussions is more challenging in this setting however, since the audience is more in flux.

In addition to the above screenings, we found that, unbeknown to us, some of the ASHAs were also organizing

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[3]Every ASHA is assigned a population of 1,000 people. This could mean one or several villages, given varied village sizes.

[4]Power is frequently in short supply in our field sites and charging the pico projector requires dedicated attention.

private screenings of their own accord. We interviewed a mother who had recently given birth. She told us that when complications arose for her during labor, her family was able to identify them as danger signs from a Projecting Health video they had seen and contacted the local ASHA immediately for facilitation of an institutional delivery to ensure the safety of mother and child. It was unusual for the entire family (husband and father-in-law included) to be present at disseminations; we had found these to consist almost entirely of women. On further questioning, we found that the mother came from a conservative upper-caste household, where it is expected for family elders to restrict young daughters-in-law from leaving the house. The village ASHA had taken the initiative to schedule and organize a dissemination in the mother's home, picking up and dropping off the projector and operating it as needed. When we followed up with the ASHA, we found that she did this frequently to reach out to similarly disadvantaged mothers, but was afraid to let us know because it *"wasn't her job to schedule ad hoc screenings"*. More interviews with ASHAs indicated that this had become fairly common practice among them, without the knowledge of the partner organizations. Further, neighborhood disputes are common in these villages, so that the ASHAs sometimes need to conduct multiple 'unofficial' disseminations in the same neighborhood.

There has also been occasional initiative on the part of the project staff to organize screenings for men alone, since they generally do not participate in the women's dissemination sessions[5]. Ajay, who is a staff member at GVS, told us that he had organized a screening of the family planning video for the men in his village. Around 25-30 men had attended this screening. Though this was a one-off event, it is indicative of the uncharted directions that the project continues to take, indicating growing community participation.

4.2.3 Impact on ASHAs

Ramachandran et al. [24] have discussed the short-term impact of their videos on the self-efficacy of ASHAs. We confirm their findings for our long-term deployment, though the underlying causes in our case are somewhat different. We have held several interviews with the ASHAs over the last two years to determine their response to the dissemination model we imposed on them. Most ASHAs whom we observed have come across as increasingly independent and comfortable facilitators. Their common responses have been, *"The films make it easier to explain things"* or *"It is easier to attract women to the MG meetings with these videos."* Kusum, an ASHA from Sareni shared:

> "Sometimes, you know, when the pico was not there, we would forget a few things now and then. Now, we do not have to remember every single piece of information. It is a lot easier this way... and the women are able to understand more."

Not only is it easier for ASHAs to conduct dissemination sessions using the videos as job aids, they sense an elevation in their social status as a result. Projecting Health operates in a heavily patriarchal society (as mentioned) where women have limited social standing and the ASHAs initially had a hard time gaining credibility. Lata Devi, an ASHA for the last 3-4 years, shared her experience. Before Projecting

Health, Lata said she would feel like a *"loser"* and frequently default on her duties. The local AWW agreed, saying that Lata was *"transformed"* as a result of this project. Projecting Health, Lata told us, has brought her greater respect within the community; she no longer feels *"outcast"*. Other ASHAs we interviewed also shared that they and their work were taken more seriously by their communities after they became involved with Projecting Health. In addition to dissemination sessions, ASHAs have also benefited from being cast in the films. For instance, Janaki, an ASHA who had appeared in a family planning film, told us that she often runs into strangers who recognize her from the film. In her own village, where the video was shot, she claims to enjoy a kind of celebrity status as a result. This impact on the ASHAs is important not just in and of itself, but because it incentivizes and sustains their involvement in our project.

4.3 Informing the Households

Information from the films is carried via dissemination sessions into households by attendees. Kumar et al. [16] identified the household as the *"locus of behavioral action"* in sociodemographic settings such as ours. We included households into our inquiry to understand how the information disseminated by the videos was received in the households. A major challenge, as studied by Kant [15], is that in the inherently patriarchal families across our field sites, husbands and in-laws exercise considerable influence over the young mother or mother-to-be.

4.3.1 Working with Patriarchy

Building on the findings of [15, 16, 24], we extended our focus beyond the pregnant or new mothers to multiple family members. We learned that when Gita, who was pregnant, and her mother-in-law saw the film on 'danger signs in pregnancy', the family arranged for emergency transportation when Gita went into labor. Durga, a new mother, became interested in family planning after she saw our film on the topic. She tried to convince her husband and mother-in-law and eventually succeeded in adopting family planning methods with the help of her ASHA. Radha, a mother-in-law, who had seen the film on birth preparedness at a Mothers' Group, went home and shared the information with her daughter, who then adopted the practice herself. Lakshmi, a new mother, saw the film on exclusive breastfeeding and told her husband about it. Together, they convinced the mother-in-law not to feed the baby honey, so that Lakshmi could feed her baby exclusively[6].

What we highlight with these "success stories" (as labeled by our partner organizations) is not successful behavior change results, but the fact that the information in our films reached several family members, some of who would be likely to oppose it while others would act on it or advocate for change. Often, there is a complex negotiation of authority taking place. We had anticipated that the new mother would always be the advocate for change, but this was not the case. Very often, it *is* the older generation promoting potentially deleterious traditional practices such as placing cow dung on the umbilical cord. However, we found the opposite to be true as well, with the mothers-in-law trying to convince their daughters-in-law to adopt the practices in our films. For example, we came across a new mother who

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[5]Often, 2-4 men can be found peering in during dissemination sessions out of sheer curiosity

[6]We cannot guarantee the truth of these stories but have tried to validate these accounts by triangulation.

had been concerned that breastfeeding would make her weak and her mother-in-law had set her mind at ease, *"because she saw it on film"*. Since the men were the decision-makers at least as far as incurring expenditure was concerned, targeting them was essential, an ASHA from Sareni reasoned.

We interviewed young women, mothers-in-law as well as grandmothers-in-law, and men whose wives or daughters-in-law were attending our sessions. An older women (70+) argued that *"they knew what they were doing"* in their times, though the others were largely convinced that it was okay to *"change with the times."* The men told us they had been fairly curious at the beginning (and we often observed them trying to peek into dissemination sessions), but they were now willing to support the women's attendance, which is significant. *"It is good for them [the women] to have this information,"* was the general feedback we got. We also found from the staff that the number of community voices opposing or suspicious of our project had fallen considerably.

4.3.2 The Advantages of CVE

The visual medium is tremendously popular in rural communities, where literacy rates remain low. Be it Bollywood films, television shows, or the recent proliferation of mobile visual media, video continues to be an integral component of rural Indian culture. Our findings also indicate that the repeatability of video has been crucial; new information must be encountered several times before it influences its audience, we were told. Many of our films are subject to repeat viewing, based on the ASHA's availability. Also, video is seen to carry authority of its own, in addition to authority exercised by the featured village leaders or clinicians. The fact that the perspective the video puts forth has been recorded into an artifact and *"someone has actually made a proper film on it"* encourages our target audiences to take it more seriously than a spoken message. It also helps that these videos are associated with what is now recognized as a trusted community mobilization effort. However, the greatest benefit of these films, as our interviews indicated, has been its hyperlocal character. One ASHA reported:

> "The films we generally get to see are mostly shot far away, like Bollywood films. This is the first time we are getting to see films made locally, with actors like us... who we know and can relate to. Why will we not want to see them?"

That these videos are designed and produced in their hyperlocal context is a large source of motivation and cause for engagement for our immediate target audience - the mothers, but also our extended target audience - the households.

4.4 Scaling to the Community

Inspired by Kumar et al.'s [16] approach to behavior change, our focus had been on bringing Projecting Health into the household. In this section, we discuss the ways in which the community became involved, with the Community Advisory Board being the most significant contribution of our project.

4.4.1 Community Advisory Board

The idea of a Community Advisory Board (CAB) was introduced by us to our partner organizations at the beginning of our deployment, with the goal of facilitating local ownership of the project. They then took on the task of setting up one CAB per block. The chief functionary of GVS informed us that his main criteria for selection of the CAB members were *"representation - so that different community members' voices could be heard, interest in participation - because this was not a paid position, and the expertise to ensure that the messages were articulated in a correct, appropriate, and relevant manner"*.

GVS and NYST identified key stakeholders in their blocks who would add value to the CAB and, based on the recommendations of these initial members, the rest of the CAB members were determined. A sub-committee - the Technical Resource Committee (TRC) - was established, with the goal of providing quick and essential feedback on the video production process. This committee consisted of seven members and its main charge was to ensure that the video production took place seamlessly, since obtaining approval from the entire CAB for every video would be a logistical nightmare. The membership of the TRC was decided based on availability of particular CAB members and the diversity of experience they had to offer. For instance, ASHAs play a critical role because they are most intimately familiar with the mothers and the Medical Officer In-Charge contributes towards ensuring that the information disseminated is accurate. Other members of this TRC include other frontline health workers, project staff, the Block Health & Education Officer (HEO) and others.

The chief functionary of NYST called the CAB the *"backbone of Projecting Health"*. The CAB is responsible for factoring in the inputs of all members in deciding on the key messages for the videos. Several potential topics are discussed and, we were told, *"Ideas discussed in the CAB are not rejected... they are put in the parking lot. Based on the different priorities of the CAB members, some of these ideas get picked up and implemented, while others are added to the knowledge bank"*. Once the key message is decided on, the video production team generates the storyboard and (through an iterative process) obtains approval for this storyboard from the TRC. This process takes a few days, sometimes longer. When there is conflict, as does occasionally arise, greater weight is ascribed to technical correctness. For instance, the Medical Officer In-Charge's view was considered correct in the discussion on temporary contraceptive methods, and this was then used in the video as well, despite the fact that there was some dissent among the CAB members on this topic. Once the TRC approves, the team goes ahead and shoots the video, following this up with a screening, and reports back to the CAB in the next (quarterly) meeting. This process allows the video production team to develop greater confidence in their work, since it is regularly subjected to review, approval, and feedback.

The CAB's effectiveness, we were told, comes from its diversity of stakeholders and the management of power dynamics. The breadth of experience of the members allows for the creation of videos that are locally sourced and address the needs and sensitivities of the target audience - the pregnant/lactating mothers in these blocks. Members of the CAB contribute on a voluntary basis. They are not paid, nor are they forced to participate. Their motivation, the chief functionary of GVS shared, is the reason for the CAB's success; *"every member is free to give as they are willing."*

4.4.2 Connecting with the Community

The CAB members - individually and collectively - have been instrumental in shaping community ownership of the

project in various ways. First, the ASHAs and other front-line workers have contributed to ensure that the needs and opinions of the communities are represented. For instance, after the first family planning methods film was produced, an ASHA in Bachhrawan's CAB conveyed her Mothers' Group's request that more detailed information about specific methods be provided in future films. This led to the creation of videos on intrauterine devices (IUDs) and vasectomies. Second, the clout that many of the CAB members have, because of their work responsibilities or social status, has been effective in instilling trust in the community towards Projecting Health. Dr. Madan is the local Medical Officer In-Charge and also a member of the Bachhrawan CAB. We found him to be very well-respected by others in our focus group sessions and were told by the GVS staff that his association with Projecting Health made it easier for the audience to trust the project. The presence of government officials has also made it easier to secure dissemination venues. Third, Sanjay Tiwari - a member of the Khiro CAB who also has ties with the press - has been instrumental in producing press stories and generating good publicity about the project. Even in our field visits, we would see newspaper articles by him reporting that researchers from 'America' were visiting to see how the project was operating. These headlines included *"American group came to see the details about local health program"* and *"Community gave information regarding health program"*. The slight misrepresentation of us visiting to see 'their' project was helpful, Tiwari claimed, in creating a positive image about Projecting Health.

Working *with* existing power structures within the community is critical to obtain the support of the people. Being attentive to and enrolling both the powerful and the (relatively) power*less* community members is important, even when they are not part of our target audience *or* the films. We also highlight that much literature on community-focused projects seems to view the community as a 'flat' entity, but there do exist differences that must be accounted for. Even within the CAB, which we initially saw as a relatively flat and representative structure, we realized that members are extremely mindful of the different power equations and how they must present their ideas or solicit feedback without offending any egos. This was evident, for instance, in the storyboard approval process that the video teams have adopted. They follow a tedious process of pursuing every CAB member who must approve their storyboard, sometimes having to make repeated phone calls and travel great distances. The higher the status of the particular CAB member, the more running around the team must do, Ratan from the video production team at Khiro explained to us.

5. DISCUSSION

Our study presents the first long-term deployment of video-based instruction for health information in ICTD. For future initiatives that would like to adapt our model to their needs, we have explained how CVE was integrated with existing community practices, state-supported health care infrastructure, social and patriarchal structures, and power dynamics within our target populations, also describing the roles of the actors who were instrumental at every stage.

5.1 The Information Spiral

We used the lens of information flows to frame our findings, tracking the process by which health messages are gen-erated, captured on video, and brought before their target audience. Instead of viewing this information as having a source and a destination, we see its flow as a widening *spiral*. Ideas generated within the CAB are implemented and brought before the mothers and other community members, and the feedback and response from the community finds its way back into the CAB through the frontline workers, with requests for *more* information and greater detail, as we saw in the example of the films on family planning methods. Gradually, the community requests have diversified, and included topics such as cleanliness, sanitation, or even topics appropriate for adolescent girls, such as menstruation. We see value in thinking about information as a starting point of this growing *'knowledge bank'* that - although initiated exogenously - is increasingly becoming *of* the community, *for* the community, and *by* the community. Future work aims to explore the contribution of diverse information dissemination channels to this knowledge bank.

5.2 Deromanticizing the local

This brings us to our next point of discussion - the value of 'local'. Although our approach does align with the ideologies of participatory development [23], we also agree with Mohan and Stokke's [21] critique against 'romanticizing' the local. As we highlight in our Findings section, 'local' does not imply a homogeneous, uniform group of people. We described how the operationalization of Projecting Health required us to work with varied available community resources (for video creation), state-supported health care infrastructure (for dissemination), patriarchal structures (for assimilation), and community power dynamics (for continuation of the project). There are all kinds of difference-creating factors at play, and they must be accounted for in approaches that seek 'strong participation' [20, 3] as we did.

5.3 Generalizability across Domains

We cannot guarantee that CVE would hold across domains. Projecting Health and Digital Green [11] demonstrate that the needs of the domain and thus, the target populations, can vary starkly. For instance, our focus on the household may not translate directly to other domains if the continuity of cultural practices is not valued as highly. What we emphasize from our work is that we deployed the CVE model *taking into account* existing social practices and power structures, which allowed for a better ecological fit. Generalizing CVE to other domains would require similar modifications for local context.

6. CONCLUSION

We described Projecting Health - a health care initiative we implemented to provide useful information to new and expecting mothers for their and their children's health. We also presented our model of Community-led Video Education as an effective means of leveraging community resources towards information generation, dissemination, and assimilation - a central concern for ICTD research. We used the lens of information flows to structure our findings, highlighting the spiraling flow that contributes towards a 'knowledge bank' created of, for, and by the community. We also used our findings to show that aligning with community resources, state-supported health care infrastructure, social and patriarchal structures, and power dynamics within our target populations is critical for driving community ownership.

7. ACKNOWLEDGMENTS

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