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# The Pertinence of Maternal Education on Child Immunization in Rural Uttarakhand: More Than Just Increased Rates

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*SIT Study Abroad*

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THE PERTINENCE OF MATERNAL EDUCATION ON CHILD  
IMMUNIZATION IN RURAL UTTARAKHAND: MORE THAN JUST  
INCREASED RATES

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India: Health and Human Rights  
Fall 2013

The people's health ought to be the concern of the people themselves. They must struggle for it and plan for it. The war against disease and for health cannot be fought by physicians alone. It is a people's war in which the entire population must be mobilized permanently (Sigerist 1941).

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## Abbreviations

ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
ICDS	Integrated Child Development Services
NGO	Non-Government Organization
NFHS	National Family Health Survey
NRHM	National Rural Health Mission
PHC	Primary Health Center
UIP	Universal Immunization Program

## **Abstract**

Child immunization rates in India continue to remain low, despite the 1985 implementation of a Universal Immunization Program that provides free basic immunizations to all children. There are numerous logistical factors that contribute to the low rates of immunization, but rates are made further worse by a lack of parental awareness and education about immunization, especially in village communities. This study examines the maternal understanding of immunization in rural Uttarakhand, both in villages in which an NGO has been working to improve maternal immunization education and in villages with no NGO involvement. It finds a positive correlation between increased immunization education, increased maternal knowledge of immunization, and increased health seeking behavior of mothers.

## Introduction

Immunization has long been recognized as a highly cost effective way to decrease child mortality in developing countries, seen as beneficial “for not only child survival, but also for promoting primary health care” (Patra 2006). And yet, according to the latest survey from the World Health Organization, more than 1.5 million children under the age of five die annually from vaccine preventable diseases, and 500,000 die annually in India alone (WHO Global Immunization Vision and Strategy 2008).

In theory, India’s health policy ensures all children receive a basic immunization package free of cost. Launched in 1985, India’s Universal Immunization Program (UIP) outlines that children should receive at minimum one BCG injection (to protect against tuberculosis), three DPT injections (to protect against diphtheria, pertussis, and tetanus), three oral doses of Polio and one Measles vaccine. If the schedule is adhered to properly, these eight vaccines should be completed within nine months of birth (Universal Immunization Program 2013). In recent years, booster vaccines for BCG, DPT, and Measles, as well as three Hepatitis B vaccines, have been added to the UIP’s list of provided vaccines; however, efforts to improve child immunization rates focus on completion of the basic package and thus do not prioritize the boosters or Hepatitis B (Universal Immunization Program 2013).

Despite the implementation of a well-organized scheme, rates of complete basic child immunization remain low in India. According to the National Family Health Survey (NFHS), only 44 percent of children age 12- 24 months are fully



vaccinated nationwide, and in poor and rural areas, the rates drop even lower (NFHS-3 2007). And while lack of reliable services is oft cited as the most prominent reason for the low rates, lack of parental immunization education is also thought to be a large impeding factor (Patra 2006). Furthermore, lack of immunization education serves as an even greater impediment in rural areas because provided services are farther away and parents tend not to prioritize trips to the health centers (Banerjee et al. 2010).

Consequently, increased parental education concerning immunization has the potential to drastically improve immunization rates, especially in rural areas. In terms of the parental view of immunization, parents in rural areas are often “not actively opposed to” immunization, but simply lack the awareness to properly evaluate the choice to immunize (Banerjee et al. 2010). As such, education and increased awareness could serve as long-term solutions to increase rates (Banerjee et al. 2010). The potential benefit of increased maternal education is supported by analysis of national child immunization data, which indicates a “strong positive relationship between mother’s education and children’s immunization coverage” (Patra 2006). Education, and more specifically maternal immunization education, could be the key to changing the health seeking behavior of mothers, and subsequently communities, with regard to immunization.

In fact, various NGO’s have adopted this rational, and have begun using maternal immunization education as the platform through which to increase child immunization rates. Aarohi is one such NGO, working to improve child immunization in rural Kumaon, Uttarakhand in villages where this study was

conducted. Aarohi works to provide supplementary education and training to local health workers to increase immunization education and awareness among mothers. Drawing upon Aarohi's established relationships and current work, the present study looks at the understanding of immunization among mothers in intervention and non-intervention villages.

## Objectives

This study explores the effects of maternal immunization education by comparing the maternal understanding of immunization in areas with and without Aarohi's increased education. The focus of this study is thus twofold: to gain a general understanding of maternal immunization knowledge and awareness, and to compare how this knowledge base differs between villages with and without increased education. This comparison will help determine whether increased maternal immunization education is in fact a successful tool for improving immunization coverage.

## Methodology

The information reported in this study was collected during six field visits in two blocks of rural Kumaon, Uttarakhand: Bhainsyachana Block, in which no working NGO was present and Okhalkanda Block, in which AaroHi worked to educate and train the Accredited Social Health Activists (ASHAs) regarding immunization. The field visits to Bhainsyachana Block consisted of a visit to the Auxiliary Nurse Midwife (ANM) center on immunization day and conducting interviews with ASHAs, an ANM and mothers of children being immunized. Interviews were also conducted with mothers of children 0-24 months in a village. The field visits to Okhalkanda Block again consisted of interviews with ASHAs, an ANM, and mothers of children 0-24 months in the villages, though no immunization day was observed in Okhalkanda.

A total of 3 interviews with ANMs, 6 interviews with ASHAs and 19 interviews with mothers were conducted over the course of two weeks (see **Figure 1**). Interviews lasted between fifteen and thirty minutes and were conducted in Hindi and translated into English with the help of an AaroHi translator. Interviews varied in terms of privacy; while complete privacy was attempted, interviews with mothers at the ANM center were occasionally in the proximity of an ASHA or ANM and interviews with mothers at home were sometimes conducted in the presence of in-laws. All interviews were recorded upon permission and were subsequently transcribed. Verbal and written consent was obtained for all interviews. When available, vaccination records of the children whose mothers were being interviewed were documented in combination with the interview. For both mothers

and health workers, an interview questionnaire was loosely followed, but the interview remained open to the direction of the respondent. For privacy and protection purposes, village names have been changed in this paper.

**Figure 1:** Field Visit Schedule

Date	Block	Village	Total interviews	Interviews with:		
				Mothers	ASHA	ANM
November 12	Bhainsyachana	Ramoli	3	1	1	1
November 13	Bhainsyachana	ANM Ctr	9	6	2	1
November 14	Bhainsyachana	Ramoli	3	3	0	0
November 19	Okhalkanda	Khandu	5	3	1	1
November 20	Okhalkanda	Bandai	5	4	1	0
November 21	Okhalkanda	Mupal	3	2	1	0

## Universal Immunization Program: Theoretical vs. Reality

### Theoretical

Increasing maternal and child mortality rates is at the forefront of India's health agenda and improving immunization coverage has long been a part of that mission. The importance of increasing immunization is stressed not only because immunization has the benefit of increasing child mortality, but additionally because it has been found to raise the overall health standard of communities (Patra 2006).

Policy wise, India has been working hard to provide free basic immunization to all children for quite some time. As early as 1978, India implemented the World Health Organization's Expanded Program on Immunization (EPI), which aimed to provide basic immunization to all children. Then, in 1985, India expanded on the EPI and launched their own Universal Immunization Program (UIP) in hopes of improving services and extending coverage (Patra 2006). Completion of the UIP's eight vaccines should be completed within nine months of birth, if the schedule is properly followed (see **Figure 2**). Technically, in 2007, India again expanded the UIP with the addition of three Hepatitis B vaccines and boosters for BCG, DPT, and Polio, but implementation of those additions has been slow to initiate. Thus, the UIP still defines children who have received the eight vaccines covering BCG, DPT, Polio and Measles as fully immunized (Universal Immunization Program 2013).

**Figure 2:** Recommended Infant Immunization Timeline:

	Birth	6 weeks	10 weeks	14 weeks	9-12 months
BCG	X				
OPV-1, 2 & 3		X	X	X	
DPT-1, 2 & 3		X	X	X	
Measles					X
Hep-B 1, 2 & 3**		X	X	X	

As of now, India has introduced the UIP in every district nationwide, and aims to achieve 100 percent child immunization coverage, though 85 percent coverage would be enough to ensure herd immunity (Patra 2006). Immunizations are made available at all government hospitals as well as locally at ANM centers or *Aanganwadi* centers in villages on scheduled immunization days.

### Reality

Unfortunately for India’s children, the policy outline of the Universal Immunization Program differs strongly from the reality. To quote Gupta and Murali in their 1989 National Review of Immunization Programme in India, achievement of the target immunization coverage “remains a distant dream” (1989). And recent critics further note that though “lots of energy and money has been spent on the UIP, it [has] not reap[ed] the much hyped outcome” (Patra 2006).

That being said, the low, 44 percent rate of full immunization coverage of children age 12-24 months found in the latest National Family Health Survey (NFHS) is not equally felt in all areas of the country. Immunization rates vary drastically by region; less than a third of children are fully vaccinated in Nagaland,

Uttar Pradesh, Rajasthan, Arunachal Pradesh, and Assam whereas at least three-quarters of children have received all the recommended vaccinations in Tamil Nadu, Goa, and Kerala (NFHS-2007).

Moreover, it is not to say India's UIP has seen no success. Immunization coverage has improved substantially since 1992, when only 36 percent of children were fully vaccinated and 30 percent had not been vaccinated at all (NFHS-1 1994). Additionally, percentage of children who have received partial coverage is much higher than percentage fully vaccinated: 76 percent of children have received BCG, the first dose of DPT, and all three doses of Polio vaccine (NFHS-3 2007).

Because so many issues with immunization coverage tend to converge around inconsistencies in following the immunization schedule and failure to complete the schedule, the UIP created immunization cards to give to all parents with their child's first immunization. These cards, which follow the schedule in **Figure 2**, are dated with each administered vaccine and serve both as a timetable for mothers to adhere to as well as a vaccination history for the child to avoid repeat vaccinations.

### Room for Change

Though rates of immunization coverage in India are not yet where they need to be, there is potential for change. There was an initial dramatic rise in immunization rates when vaccines were first being introduced, but now something more is needed to extend coverage to those most resistant to immunization (Banerjee et. al 2010). Increased maternal education is one such new strategy shown to have a strong potential to improve child immunization. As such, efforts to



improve immunization rates have begun to focus on improving maternal awareness and knowledge of immunization. Analysis of NFHS-2 found that maternal access to and usage of health services is the largest factor determining child and family health and that maternal education is a large determinant for child immunization coverage (Patra 2006). The same analysis found the positive relationship between maternal education and children's immunization coverage to be so strong that the chance for child immunization was almost three times higher with mothers with high school or above education than with illiterate mothers (Patra 2006). Furthermore, maternal awareness of immunization had a strong positive effect on vaccination: the percentage covered was 33 percent for children of mothers unaware of immunizations and 58 percent for children of mothers with some immunization awareness (Patra 2006). Both maternal education and awareness of immunization have been shown to increase the percentage of child immunization; thus, maternal education has become a focus for improving immunization rates.

Though the reality of India's immunization coverage does not yet match the proposed ideal, the situation at least has shown potential to change. Rates of immunization have improved significantly in the last twenty years, although the rate of change is now slowing down. While rates have historically improved with the simple increase in vaccine provision, it seems that now a new methodology is required to see future improvements. Maternal immunization education and awareness has the potential to be that change.

## Maternal Awareness with no NGO involvement

### Bhainsyachana Block

As a rural block with good health indicators, but no current health involvement from an NGO, Bhainsyachana Block served as a baseline indication of maternal immunization awareness in an area with no NGO. Located in the Kumaon region of Uttarakhand, Bhainsyachana has seen a recent rise in immunization levels thanks to an increased supply of immunizations from the government and increased storage capabilities at the ANM center (Personal interview, ANM, 12 Nov. 2013).

Immunization coverage in Bhainsyachana was appropriately laid out. Immunization days in Bhainsyachana are held weekly on Wednesdays at the ANM center, and monthly in each village at the local *Aanganwadi* center. The ANM is required on site on immunization days to administer the vaccines, while both ASHAs and ANMs are responsible for encouraging attendance and ensuring that mothers bring their children on schedule. The ANM adhered to the UIP immunization scheme, with the exception of the Hepatitis B vaccine, and mothers were observed utilizing government immunization cards. The ANM tracked the schedule of each child's immunization in her records, and upon first immunization, would write the date of the next immunization on the card (Immunization day, direct observation, 13 Nov. 2013). Mothers reported they were reminded to come either by a phone call from the ANM or a visit from the ASHA (Personal interview, Mothers #1, 2 and 3, 13 Nov. 2013).

The visit to the ANM center in Bhainsyachana on immunization day also proved promising: the ANM was present along with the ANM supervisor and there was no shortage of supplies. There was a steady flow of both pregnant mothers and mothers with 0-24 month babies coming to get immunized, and, with one exception, all had their immunization cards with them. All mothers came alone or with an ASHA. The ANM also kept diligent records by hand, recording each child's immunization in her UIP sanctioned records. In terms of storage, the ANM had both an icebox to keep the vaccines cold while administering, as well as an ILR and a deep freezer for long-term storage (Immunization day, direct observation, 13 Nov. 2013).

According to the ANM's records, Bhainsyachana saw a 100 percent completion rate in immunization coverage, though the Integrated Child Development Services (ICDS) office could not procure the records to verify that claim. Still, it appeared that the children of most parents who were coming to the ANM center completed immunization on time. There were some minor fluctuations in completion time, but those were accounted for primarily by varying start times – children born in government hospitals were administered BCG and 0 dose Polio at birth, whereas home delivery babies received their first immunizations after several weeks (Personal interview, ANM, 12 Nov. 2013).

There were, however, a couple of issues in the immunization scheme witnessed in Bhainsyachana. The immunization cards were of the pre-2007 model and did not include Hepatitis B, a problem given that the ANM reported sometimes administering Hepatitis B when it was available. Furthermore, though not included in the government scheme or on the immunization card, the ANM mentioned that in

the past 2 years the government had been sporadically providing the Hepatitis A vaccine because of the local prevalence and that she administers it when available (Personal interview, ANM, 12 Nov. 2013). There was no record, however, of such immunization, which proves troublesome because most mothers relied solely on the cards for monitoring their child's immunization and had no idea what vaccines the ANM administered (Immunization day, direct observation, 13 Nov. 2013).

Furthermore, interviews with mothers in Bhainsyachana revealed more shortcomings with the system. Though all mothers interviewed had their immunization card and were following it more or less on schedule, not one mother could name any of the vaccinations her child had received. When asked what they knew about vaccines, mother's responses ranged from "I do not know anything about vaccines" to "they are good for the child" (Personal interview, Mothers #2 and 4, 13 Nov. 2013). Mothers reported that they chose to have their children immunized not because of personal beliefs, but because they were told to by the ASHA, the ANM or an in-law. Mothers reported that though they saw other mothers immunizing their children, they did not engage in any community immunization dialogue with other mothers (Personal interviews 13 and 14 Nov. 2013). Though immunization had become a common enough practice in Bhainsyachana for women to regularly immunize their children, there was still a lack of vaccination knowledge and community dialogue amongst mothers.

The lack of immunization education also led to misconceptions and fears amongst mothers. One mother reported feeling scared and untrusting of vaccinating her child after her daughter got jaundice. The details of the incident did not seem to

indicate that the jaundice was in any way related to vaccinations, but the mother thought the Hepatitis B vaccine her daughter received a month before was the cause. Therefore she stopped vaccinating her daughter after that and ceased vaccination of her son as well (Personal Interview, Mother #1, 14 Nov. 2013). Thus, the lack of education and communication regarding immunization can lead to fears and immunization dropout as a reaction.

Moreover, the lack of knowledge among mothers over what illnesses vaccinations protected against led to false rumors concerning their effectiveness. Most mothers thought that in immunizing their children, there would be no future health complications for the child and thus reported confusion as to why their child suffered pneumonia or other illness post immunization (Personal Interview, Mother #1, 13 Nov. 2013 and Mother #1, 14 Nov. 2013). The common sentiment among mothers was that immunizations must not be that helpful because children still get sick afterwards (Personal Interview, Mother #1, 12 Nov. 2013). Thus, the lack of education about which illnesses vaccines prevent against led to incorrect rumors concerning immunization effectiveness and consequently a devaluing of the importance of immunization.

The lack of education and awareness of vaccines in Bhainsyachana seemed to stem from a lack of dialogue between mothers and the ASHA or ANM. All mothers reported that neither the ASHA nor the ANM informed them about vaccines, either when encouraging them to get their children immunized or when administering immunizations. Not only did ANM not tell them which vaccine their child was receiving, mothers said there was no mention of the potential side effects either,

namely that the child might suffer fever for one or two days after the immunization (Personal Interview, Mother #1, 13 Nov. 2013). This lack of information only further increased distrust in the local health system because ASHAs or ANMs never served as sources of information to quell mother's fears or answer their questions. This distrust in local services was so strong, that one mother in Ramoli, reported paying for immunizations at a government hospital in the nearby city of Almora because she "felt safer there than at the ANM center" (Personal Interview, Mother #2, 14 Nov. 2013). Other mothers in the village shared her lack of trust in the local ANM and ASHA as well, and reported that they rarely sought help or explanations from the ASHA or ANM with child health complications.

Though mothers in Bhainsyachana communicated with ASHAs and the ANM about vaccination dates, there was no effort on the ASHA or ANM's behalf to try to more fully explain immunization to mothers. Further, while the ANM in Bhainsyachana appeared to be adhering to proper schedules, there was no monitoring of her administration, as mothers demonstrated no basis with which to monitor vaccines being administered.

As a result, though Bhainsyachana had relatively good immunization coverage on paper, the lack of dialogue between ASHAs and mothers proved to inhibit maternal knowledge and awareness of immunizations. This in turn seemed to decrease mother's trust in the local health community and facilities. Furthermore, though all mothers had begun to immunize their children, lack of knowledge about the side effects of immunizations, contributed to immunization drop out. Though immunization rates in Bhainsyachana were high, the lack of immunization

awareness was felt in other ways, contributing to a lack of trust in the health system and tendency to stop immunizing when complications occurred.

### Okhalkanda Block

Another rural block in Kumaon, located not far from Bhainsyachana, Okhalkanda faces a very different health situation. Some villages in Okhalkanda have seen intervention from Aarohi, while others remain untouched, but overall baseline health indicators are low.

Khandu is a village in Okhalkanda with no NGO or increased maternal education, but, unlike villages in Bhainsyachana, experiences low immunization rates, thus serving as a comparison between areas without increased education.

In Khandu, there were many problems surrounding immunization in the village; rates of immunization were as low as 64 percent coverage and there was a very strong parental resistance against immunization (ANM records 2012).

The immunization delivery setup was properly laid out in Khandu: the ANM comes to the local *Aanganwadi* center on the first Thursday of every month to hold the immunization day. According to the ASHA, the ANM comes reliably each month and save for a couple of occasions has always had ample immunizations (Personal interview AHSA Nov. 19 2013).

The low immunization rates in Khandu were instead due to parental reluctance to have their children immunized (Personal interview AHSA Nov. 19 2013). The ASHA reported that since many parents are uneducated and unaware about health issues, they have no grasp as to the importance of vaccinations. She reported that mothers in the village hardly ever utilize the government health

facilities for their children in general, which makes her job of convincing them to come for immunizations doubly hard (Personal interview AHSA Nov. 19 2013).

The lack of maternal willingness to immunize was the result of the ASHA's inability to articulate the benefits of immunization. When pressed as to why it was so hard to convince mothers of the importance of immunizations, the ASHA blushed and responded that she herself did not know enough about them and, as such, no one respected her or listened to her as an ASHA. Though she had received her government training, she confessed she did not receive enough information for her to confidently explain exactly why immunizations were beneficial in preventing diseases. She thus could not properly convince mothers of the importance of immunization nor respond when mothers asked her why their children suffered fever after immunization (Personal interview AHSA Nov. 19 2013).

One mother echoed the ASHA's statements about maternal unawareness, confirming that parents in this village were reluctant to immunize and adding that their reluctance to immunize stemmed from a lack of information about vaccines. No one in this village believes in immunizations she said. "Even if they go and get them, they do not think they are that important" (Personal interview Mother #1 Nov. 19 2013). She also said that while she had no hesitations about immunizing her child, many parents in this area do because they hear rumors about the fever that results. "No one at the ANM center tells parents about the side effects," and while she understood that after the immunization, a child might have a slight fever for the next days, most parents interpret the fever as a sign that the immunization failed (Personal Interview Mother #1 19 Nov. 2013). The lack of understanding works as a



domino effect, she emphasized, parents talk and then the rumors surrounding immunization only spread.

The insights of this mother, however, were not reflective of the mothers in Khandu, as she was actually a highly educated mother from a village two hours south. She was only in Khandu to visit her in-laws. Most mothers she had talked to in Khandu had no idea about immunizations (Personal Interview Mother #1 19 Nov. 2013). So while not indicative of the mothers', her knowledge of immunizations served to highlight the difference between educated and non-educated mothers.

The mother also mentioned, that parental resistance to immunization was not necessarily a problem that could be solved by the ANM. She thought the lack of understanding of and trust in the local health system was rooted in a larger problem and it was up to the awareness of the village to change. Parents need to be more educated for themselves she said (Personal Interview Mother #1 19 Nov. 2013). As an educated mother, she felt it was crucial for the mothers in villages like Khandu to become more aware of immunization so that they can feel responsible for their children's health.

The situation regarding immunization in Khandu, a village with no increased education and low health indicators, proved unfortunate. Not only were there low rates of immunization coverage, but there was also a strong maternal resistance towards immunizations stemming from a lack of education and awareness. Further, the situation was made worse by the fact that the ASHA felt unable to change the situation because she lacked the training and knowledge of immunizations herself.

## Maternal Awareness with NGO involvement

### Okhalkanda Block

In contrast to Khandu, Bandai and Mupal were two villages in Okhalkanda Block in which there have been attempts to improve maternal awareness and education of immunizations via more active ASHA involvement. In these villages AaroHi works to provide additional training to ASHAs in order to make them more confident, stressing to ASHAs the importance of their role in the health of the community. AaroHi also includes a small monetary incentive to motivate ASHAs to educate mothers: an additional stipend of 1500 rupees a month on top of their government salary. AaroHi focuses on maternal education via ASHAs because they believe it is the most effective way to sustainably change the health seeking behavior of parents; part of AaroHi's mission in improving healthcare is to enable communities to seek better health care for themselves (AaroHi 2012).

While both Mupal and Bandai had immunization rates of less than 70 percent in AaroHi's 2011 baseline survey, both have achieved 98 percent immunization coverage since AaroHi's involvement (AaroHi 2012). The set up of vaccine delivery remained the same, a monthly visit from the ANM to each villages *Aanganwadi* center, but the attendance from mothers increased with the additional training of the ASHAs.

Not only were the rates much improved in the two areas, but mothers in both Mupal and Bandai were visibly more informed about immunizations. In both areas, mothers were more confident talking about immunizations and even mothers who could not explain much, could name at least one of the vaccines their children had

received. Additionally the majority of mothers could explain why they thought vaccines were beneficial, mentioning they served to prevent and protect against diseases. The mothers in Bandai and Mupal reported that they learned about immunizations and their benefits when the ASHAs came door to door to remind them of immunization dates. They said the ASHAs explained to them that the child might suffer fever in the days afterwards, but that was how the immunization worked to protect the child from getting more dangerously sick in the future (Personal interview, Mother #2, Nov. 21 2013). Mothers reported that they encouraged each other to get their children immunized and one mother even said that she because she goes with other mothers to the immunization days that her daughters immunizations became a social event for her (Personal interview, Mother #1, Nov. 20 2013). The mothers in Bandai and Mupal were not only more knowledgeable about immunizations, but they also displayed a confidence talking about them that conveyed a comfort with the process.

Furthermore, besides the mothers, the ASHAs in Bandai were visibly more confident about immunization as well. The ASHAs reported that immunization used to be a huge problem, but after they received their Aarohi training, they were able to more effectively explain the benefits of immunization and mothers began listening to them. It has been a slow adjustment in maternal attitude, but the ASHAs felt encouraged that as they started to take the time to explain the mechanics and benefits of immunization to mothers they has seen a change in the maternal attendance of immunization days and maternal trust in their advice (Personal interview, AHSA, Nov. 20 2013). The responsibility both ASHAs felt for the health of

their village and the sense of empowerment they felt to improve them with their increased training was a sentiment unique to ASHAs in Aarohi villages.

Furthermore, both ASHAs reported that their newfound confidence and ability to talk to mothers about immunization was a direct result of their training they received from Aarohi. Before Aarohi, neither felt educated enough to speak to other mothers about immunization, as was the case with the ASHA in Khandu. The ASHA explained that before her additional training, mothers in the village did not respect her. But after the additional training, she had such confidence that she was able to stand her ground and explain the benefits more clearly, which she said was incredibly inspiring (Personal interview, AHSA, Nov. 21 2013). The increased training served to enable her as a more effective ASHA.

Not only did both ASHAs report being empowered by Aarohi's training, they reported feeling more compelled to make a difference in their respective villages. One ASHA reported that even when a mother did not accept her advice, she felt motivated to change the mother's mind because Aarohi had made her feel very connected to her job (Personal interview, ASHA #2, Nov. 20 2013). And the other ASHA said that the big difference was that Aarohi emphasized explaining to parents why immunizations are beneficial. That emphasis encouraged her to take the time to build a relationship with mothers so that they began to trust her and were then open to learning from her (Personal interview, AHSA, Nov. 20 2013). The additional training served to motivate the ASHAs to build relationships with mothers and spend time talking with them.

And in fact, the increased confidence and effectiveness of the ASHAs has begun to successfully improve the health mindset in the villages. The rates of immunization have certainly improved, but both ASHAs reported that they are now also seeing change in the maternal attitudes about immunization as well. The ASHA's job was beginning to get easier because the parents are beginning to learn from each other, and the trend of immunization was starting to catch. But the ASHA emphasized that it has been a struggle for her as an ASHA to initiate that change, which is why Aaroahi's recognition of her efforts encouraged her to keep working hard; with Aaroahi she finally felt appreciated (Personal interview, AHSA, Nov. 20 2013).

Additionally, the women in the villages with increased ASHA training were as a result more trusting of the ASHAs. Prior to Aaroahi, mothers reported not talking to the ASHA, but now they talk to her and each other about health much more (Personal interview, Mother #1, Nov. 20 2013). The ASHA reported that mothers approach her with more health issues and even sometimes take their own initiative to call her asking health questions. Mothers have become more proactive about health issues since the Aaroahi's increased ASHA training (Personal interview, AHSA, Nov. 20 2013).

The one problem with the otherwise glowing success story of increased ASHA training is that the ASHAs reported irritation now that Aaroahi has decreased their additional stipend. As part of Aaroahi's plan to allow the villages in which they intervene to be self-sustaining, they have decreased the ASHA's stipend from 1500 additional rupees a month to 500 in the last year. And now that the ASHAs are not

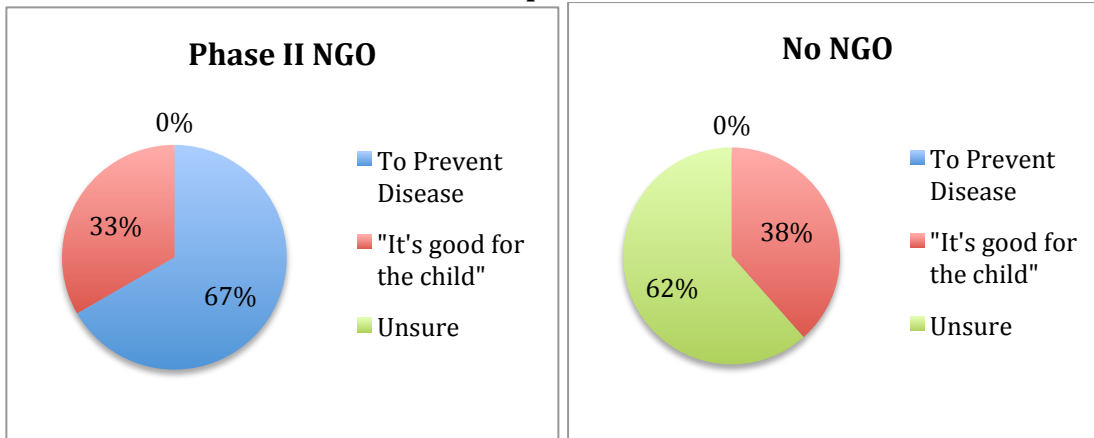
getting paid as much they no longer feels as motivated. So while the additional education worked initially, it seems the ASHAs' dedication to educating mothers was tied heavily to their 1500 stipend, which was not economically sustainable from an NGO standpoint.

The villages with Aarohi's increased maternal education saw dramatic improvement with maternal awareness of immunization. Mothers not only immunized their children regularly, but reported less confusion and complaints about immunization as a result of their newfound knowledge about vaccinations and their side effects. Furthermore, in these villages, ASHAs reported feeling more empowered to educate mothers and more inspired to make them understand the importance of immunization. Mothers and ASHAs seemed to communicate more effectively in these villages as a result of the ASHAs' newfound confidence as well. The only caveat with the increased NGO education scheme lay with the process of sustainability and the lack of funding to uphold the scheme indefinitely.

## Quantitative Comparison

Beyond a qualitative difference in immunization understanding and regard for community health care, increased immunization education saw meaningful quantitative differences as well. The addition of an NGO in a village, representing an increase in maternal immunization education, changed the majority maternal response in terms of the perceived purpose of immunization from “unsure to “to prevent diseases” (see **Figure 3**).

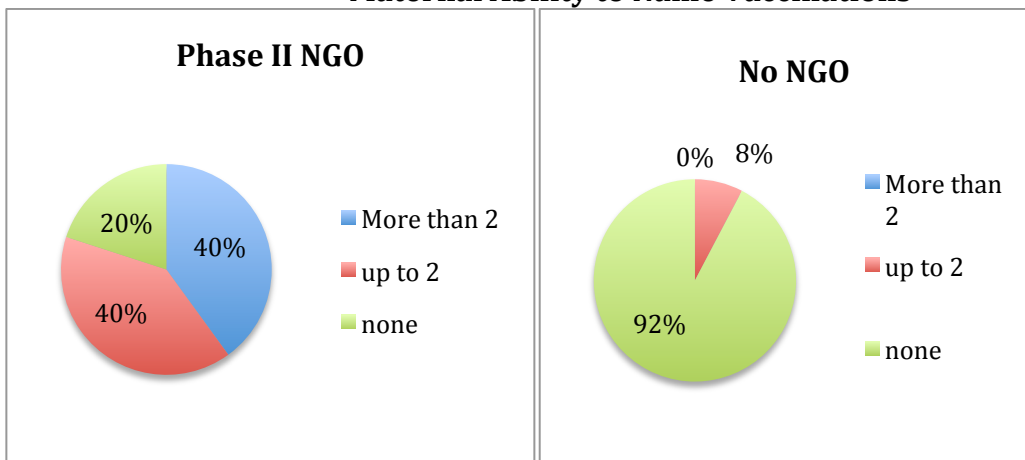
### Perceived Purpose of Immunization



**Figure 3:** Perceived Purpose of Immunization in areas with and without increased education. Knowledge shifts from 62% reporting “unsure” to 67% reporting “to prevent disease” with presence of increased education.

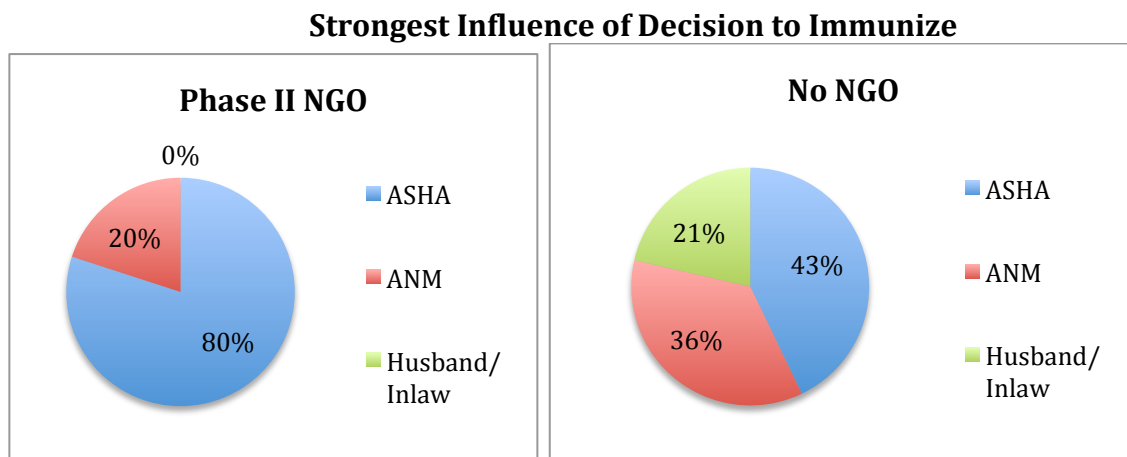
Furthermore, the presence of an NGO increased a mother's ability to name at least two vaccines her child had received from 8 to 80 percent with half of those mothers able to name more (See **Figure 4**).

### Maternal Ability to Name Vaccinations



**Figure 4:** Maternal Ability to Name Vaccination in areas with and without increased education. 92% of mothers in areas with no increased education were unable to name any vaccines, while only 20% were unable to in areas with increased education.

Interestingly, villages with and without increased education also saw a split between who most influenced mother’s decision to immunize. In areas without increased education, mothers reported an almost equal divide between ASHA and ANM and several mothers cited they were most influenced to immunize by a husband or mother-in-law. In areas with increased education, however, that distribution changes to where the majority of mothers responded that the ASHA most influenced their decision. The difference that mothers were more strongly influenced by the ASHA in areas with additional training supports the qualitative observation mothers listened to, respected and trust the ASHA more in areas with increased ASHA education than areas without (See **Figure 5**).



**Figure 5: Strongest Influence in Decision to Immunize.** Mothers in areas with increased education only reported health workers influencing, while 21% of mothers in areas with no education were influenced by an outside source.

For all three comparisons between areas with increased education and those without, a separate comparison was done between blocks to control for location as a compounding factor. These controls confirm the differences in understanding the



purpose of immunization, ability to name vaccines and primary influencing figure for mothers, are all results of increased education and not differences between the two blocks.

Education thus has the potential to change much more than just the literal rates of immunization, as it here displays the potential to change the entire mindset of mothers and ASHAs with regard to immunization. With education, mothers not only understood more clearly why immunizations were important, they were more aware of what vaccinations their children received and thus more active in participating in their child's health. Similarly, they were more engaged in communicating with their local health care workers and utilizing the resources the government provides. These findings therefore serve to support previous literature and policy stressing the need for maternal education with regard to immunization.

These findings also serve to support policy calling for more than just increased funding for supply of vaccines to improve immunization rates in India. Especially in terms of sustainability, addressing the problem of immunization must rely not only on increasing funds and services, but also on increasing community awareness and activity. "Higher budgetary allocation for preventative care might improve immunization, but only in the short run," and India needs a long lasting option (Patra 2006). The policy to improve immunization must focus on more than just supply; it must focus on education and engagement of communities in order to provide sustainable change.

## Conclusion

Eight vaccines for six vaccine preventable diseases are provided free of cost in India under the Universal Immunization Program, but vaccination rates continue to remain low more than two decades after its implementation. The present study sought to explore the maternal understanding of immunization, and how both the perception of immunization and immunization rates are affected by increased immunization understanding.

The results of this study indicate a positive correlation between increased maternal immunization education and increased maternal immunization awareness and understanding. Furthermore, while decreased maternal education did not always correlate with lower child immunization rates, it did always correlate with decreased understanding of immunizations and their importance, and with decreased maternal trust in and usage of local health services. Education increased faith in and perceived importance of immunizations among mothers, and also lessened the chance of immunization drop out. Thus, the benefit of increasing immunization education can be seen beyond the rates, as it empowers women to further educate themselves about health and build trust with their local ASHA, encouraging them to seek care with other issues as well.

Moreover, the visible improvement between areas with increased immunization education and those without, not only stresses the need for more maternal education, but also highlights the potential for an ASHA to change and empower the community. It was the additional training ASHAs received from Aarohi that served to transform mothers' mindsets regarding immunization and health

care. Well-motivated and well-educated ASHAs can play a tremendous role in communities; the only problem that remains is how to shift funding for increased ASHA training from NGOs to the government to enable sustainability of such programs.

One interesting point of note was that even in areas with low immunization rates or reluctance amongst parents to get their children immunized, never was an issue with supply or offered services observed. In all areas, weekly or monthly immunization days were established and held regularly, and the majority of the time there was an ample supply of vaccines. This finding serves to question older literature suggesting the primary issue with regard to immunization is simply due to lack of services.

True, immunization services in India need to be improved and made more reliable, but the issue of low immunization rates is so much more than just providing services. The problem also needs to be addressed at a deeper level because many parents lack a basic understanding of immunization, which creates a strong barrier in communicating importance and preventing misunderstandings. To increase immunization coverage in India and reach the goals of the UIP, policy must increase maternal education and awareness of immunization through social health workers. Vaccine provision can also be improved, but increasing supply will only go so far. In order to sustainably change the way mothers, parents and communities in India think about immunization improved health education must be implemented.

Education has the potential to change much more than just the rates of immunization in India. It can transform the way in which mothers participate in

their children's health through both knowledge empowerment and communication with local health workers. Furthermore, the benefits of education can serve to empower the people with regard to their healthcare, serving as a sustainable investment in transforming the state of public health in India.

## Limitations

The small sample size of this study serves as its biggest limitation. Due to limited time and resources, only nineteen total mothers were interviewed in the four villages. Furthermore, in some villages as little as two or three mothers were interviewed. The small numbers of mothers and villages serves to lessen the conclusively of this study's findings. Increasing the sample size of mothers interviewed and increasing the number of villages covered would best serve to validate this study's results. Moreover, it should be noted that the evaluated link between maternal understanding of immunization and maternal trust and usage of health services was based entirely off maternal interview responses. It should also be noted that given the small sample size of this study, other factors besides education could account for the differences in immunization perception between the interviewed mothers.

Access to data also proved to be limiting for this study. While Aarohi provided immunization records for villages it covered, records in areas with no NGO were nearly impossible to access. In Bhainsyachana, the ANM had some records on location, but the compiled data for the last two years was unable to be retrieved at the Integrated Child Development Services (ICDS) office despite two failed attempts, so the ANM records remain unconfirmed. Similarly, in Okhalkanda, the records at the Primary Health Center (PHC) were unable to be accessed despite over two hours at the PHC. All that could be accessed at the PHC in Okhalkanda was raw data on children immunized each month, without compiled data on percentage immunized.. Though limiting for this study, the lack of accessible and readable compiled data

underscored the lack of active government with regard to immunization coverage in these rural villages. It was clear by the formatting of the data and the time it took to access it that no one at the PHC had analyzed it. Lack of government monitoring of coverage in these villages demonstrates how the lack of accountability for the ANM to immunize every child or adhere to schedules.

Lastly, this study is limited by the fact that no mothers who actively opposed immunizations were interviewed, which confines the perspective of the study. While some mothers and ASHAs referenced mothers who did not believe in the importance of immunization, and some mothers interviewed were ambivalent towards them, no mothers interviewed were against the practice completely. Active opposition would have been a valuable voice in generating a more nuanced argument about increased education.

## Recommendations for Further Study

There are numerous ways in which this study could be expanded upon. As previously alluded to, increasing the sample size would best serve to strengthen the conclusions of this study. The second study could utilize the same methodology in the same region in order to keep all other factors constant, but simply expand the number of respondents and villages.

Additionally, while this study examined how Aarohi's methods of increasing maternal education effected immunization in villages, it would also be interesting to explore other methods of an NGO to increase immunization rates. Some NGOs have begun using non-monetary incentives, like supplementary allocations of dal to encourage mothers to immunize their children. Such efforts could be examined to compare them to the efforts of increased maternal education.

Aarohi would be a wonderful contact for interest in an expansion of this study in Uttarakhand. Contact information is as follows:

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ASHA #2. Personal Interview. 13 Nov. 2013.  
ANM. Personal Interview. 13 Nov. 2013  
Mother #1. Personal Interview. 13 Nov. 2013.  
Mother #2. Personal Interview. 13 Nov. 2013.  
Mother #3. Personal Interview. 13 Nov. 2013.  
Mother #4. Personal Interview. 13 Nov. 2013.  
Mother #5. Personal Interview. 13 Nov. 2013.  
Mother #6. Personal Interview. 13 Nov. 2013.

#### **Ramoli Village**

Mother #1. Personal Interview. 14 Nov. 2013.  
Mother #2. Personal Interview. 14 Nov. 2013.  
Mother #3. Personal Interview. 14 Nov. 2013.

#### **Khandu Village**

ASHA. Personal Interview. 19 Nov. 2013.  
ANM. Personal Interview. 19 Nov. 2013.  
Mother #1. Personal Interview. 19 Nov. 2013.  
Mother #2. Personal Interview. 19 Nov. 2013.  
Mother #3. Personal Interview. 19 Nov. 2013.

#### **Bandai Village**

ASHA. Personal Interview. 20 Nov. 2013.  
Mother #1. Personal Interview. 20 Nov. 2013.  
Mother #2. Personal Interview. 20 Nov. 2013.  
Mother #3. Personal Interview. 20 Nov. 2013.  
Mother #4. Personal Interview. 20 Nov. 2013.



## Mupal Village

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Mother #1. Personal Interview. 21 Nov. 2013.  
Mother #2. Personal Interview. 21 Nov. 2013.

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## Appendix

### Questionnaire

#### Immunization Questionnaire

Interviewer: Sarah Banerji

Date and time of interview: \_\_\_\_\_

#### **Location information:**

Block: \_\_\_\_\_

Village: \_\_\_\_\_

#### **Demographical Information:**

Name of mother: \_\_\_\_\_

Number of children: \_\_\_\_\_

Age of children: \_\_\_\_\_

#### **Immunization History of Child**

Vaccine	Month	Location
BCG		
Polio-1		
Polio-2		
Polio-3		
DPT-1		
DPT-2		
DPT-3		
Hepatitis-1		
Hepatitis-2		
Hepatitis-3		
Measles		

**Immunization Survey:**

How many children do you have? What are their ages?

Have they received their immunizations?

Why did you choose to have your child/children immunized?

Who influenced your decision to immunize? How did they influence?

How are you informed when immunization days will be? How were you informed about immunization in general?

What do you think is the purpose of immunization?

Do you think immunization is beneficial or harmful? Why?

Did you receive any information about immunization when you had your child immunized?

Has the ASHA ever explained to you about immunization?

Do you know what immunizations your child has received?

Do you know what illnesses those immunizations (or any) cover?

Did you have any hesitations about immunizing your child?

How regularly do you follow the immunization schedule?

Has your child ever suffered any side effects after immunization? Did any one ever explain to you the potential side effects of immunization?

How important is immunization to you?

Would you recommend immunization to other mothers? Why or why not?

Have other mothers ever talked to you about immunization?

Do you think most other parents in the village get their children immunized?

Would you feel comfortable explaining immunization to another parent?

Have you been satisfied with the immunization process for your child?

Other comments: