

Impacts of the Stimulate, Appreciate, Learn, and Transfer community engagement approach to increase immunisation coverage in Assam, India

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Note to readers

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Executive summary

Background

Despite a long standing national program for immunization in India since 1985, the full immunization coverage (FIC) has not reached the desired level. Completion of schedule of vaccines that require multiple doses (e.g., DPT or Pentavalent) remains a major challenge towards achieving higher FIC. Both demand- and supply-side bottlenecks contribute to sub-optimal vaccination coverage rates in India. In the context of universal immunization program (UIP) in India, most of the existing interventions are geared towards addressing supply-side challenges. But there is a growing body of literature indicating that demand-side interventions could lead to significant improvement in childhood vaccination coverage in low- and middle-income countries. Community engagement approaches can potentially address demand-side barriers while also mobilizing the community to advocate for better service delivery. Participatory engagement of communities could help identify barriers to vaccination at the local level and thus might lead to sustainable solutions in a manner which a top-down approach cannot achieve. Our proposed intervention engages with communities and strives towards increasing a sense of community 'ownership' of the issue(s).

Context

Assam state in the northeast region of India has historically faced challenges in addressing its high maternal and infant mortality indices. As per RSOC (Rapid Survey of Children), 2013-14, Full immunization coverage in Assam (55.3%) is lower than the national level (65.2%). Dropout rates of vaccines that require multiple doses were also higher in Assam than the national figures. According to the 2015 SRS bulletin, Assam had the second highest infant mortality rate in the country, 47 deaths in infants less than a year old per 1000 live births, which exceeds the national average of 37.

Topographically Assam comprises the fertile plains of the Brahmaputra river with some hilly regions inhabited by indigenous peoples or tribals or Scheduled Tribes (ST) as referred to in India. Assam comprises an area of 78,523 square kilometres (30,318 square miles), a narrow corridor running through the foothills of the Himalayas connects the state with the Indian 'mainland'. Assam shares borders with six states in the north-eastern region of India; namely to the east are the states of Arunachal Pradesh, Nagaland, and Manipur, to the south are Mizoram and Meghalaya and to the west is Tripura. It shares international borders with Bhutan in the northwest and with the country of Bangladesh to its southwest. The capital of Assam used to be Shillong in the state of Meghalaya for more than a hundred years till it was moved to Dispur, a suburb of Guwahati in 1972, after Meghalaya became a separate state of India. The STs form about 12% of Assam's population of 31.2 million (Census 2011). The main language of Assam is Assamese but a number of other languages are also spoken, for instance the Bodo language among its hill tribes.

The intervention

The proponents of this community-based intervention is the Constellation, a NGO registered in Belgium. The intervention is complex and involves prolonged interactions at the community level with multiple steps, referred to by the acronyms CLCP (Community Life Competence Process) and SALT (Stimulate, Appreciate, Learn, Transfer). In this report we

have often referred to the entire process by the latter acronym; SALT. The intent of CLCP/SALT is that communities can take the initiative, identify challenges, take actions to bring about change based on where they are and what they want to achieve, learn from their actions and share their experience with other communities.

During the implementation of the intervention, trained facilitators from local NGOs, VHAA and C-NES interacted with the communities to enable communities to leverage their own strengths for addressing their concerns, and accompanied them through a process of learning from action.

Study design and methods

We adopted a cluster randomized design with two groups to evaluate the intervention in Assam. The study included villages from three districts namely, Bongaigaon, Kamrup rural, and Udalguri. Stratified purposeful sampling was used so that the selected districts represent varied socio-demographic characteristics of Assam. The intervention group received SALT intervention for about a year (March 2017-March 2018) along with the routine immunization (RI) services. The control group received RI services alone. The study used a repeated cross-sectional design where we tracked the same sampled villages but drew independent random samples of households (HHs) at baseline and endline. Post intervention, for the endline survey we did not follow up the same HHs unlike most other RCTs, as estimating immunization coverage rates requires targeting a particular age-group of children.

Process monitoring and evaluation was done during the baseline and endline surveys. Process monitoring was done during the course of the intervention too, with some routine data being collected by the implementation team. The evaluation team in addition made observations during various stages/steps of the CLCP/SALT implementation process and conducted interviews with the villagers and other stakeholders.

This study used a mixed methods approach, with a larger quantitative aspect and a smaller qualitative component. The quantitative component used structured questionnaires to collect data from 90 intervention and 90 control villages. The required sample size used for the study is powered to detect an increase of at least 8 percentage points from an expected coverage of 84% and 79% for three doses of DPT or Pentavalent and full immunization, respectively, in the control group, with 80% statistical power based on a two-sided test having 5% level of significance, after accounting for an intracluster correlation (ICC) of 0.17 for three doses of DPT or Pentavalent and 0.18 for full immunization. We further assumed that a village will have a minimum of 15 children 6-23 month old and 10 children 12-23 month old. If there were more than 15 eligible children in a village, we randomly selected 15 children.

The qualitative methods were used for process monitoring and evaluation and also to help interpret evaluation outcomes. For qualitative data, Focus Group Discussions (FGD) was the primary method of data collection. At the end of the intervention phase, FGDs were conducted in 28 villages which include 22 intervention and 6 control villages.

Outcomes measured and statistical analyses

Our study assessed the intervention's impact on two primary outcomes— full immunization in children 12-23 months old and three doses of DPT or Pentavalent in 6-23 months old children. We analysed the effect of the intervention by comparing outcomes at endline between the intervention and control arms, after adjusting village-level log odds of coverage at baseline. We used a random effects logistic regression model to analyse the binary outcome variables clustered at the village level. The unadjusted model includes only two explanatory variables; the treatment assignment indicator and the baseline village-level log-odds of the outcome. Explanatory variables in the adjusted model include, in addition to the variables in the unadjusted analysis, district, gender and birth order of the child, mother's age, education, spouse's education, household head's religion and caste, household wealth quintile, and village-level variables –proportion of households in the poorest wealth quintile, proportion of mothers who cannot read and/or write, and average travel time to vaccination site.

Key findings

The adjusted analysis shows that the intervention has had no effect on full immunization in 12-23 months old children as the odds ratio is close to 1 (OR= 0.97, 95% CI (0.70,1.34)). Also, the odds of receiving all three doses of DPT among 6-23 months old children is similar across the intervention and control arms. The results for the adjusted and unadjusted analyses are very similar.

None of the subgroup analyses based on various factors such as district, gender of the child, birth order of the child and village-level baseline full immunization coverage, showed a significant effect of the intervention on either of the primary outcomes. However, some of the results were promising, but they were not statistically significant. For example, in villages that had a low full immunization coverage at baseline, children in the intervention arm were 1.4 times more likely to receive all three doses of DPT than children in the control arm. However, this finding was not statistically significant.

The qualitative data showed mixed results: while many mothers and grandmothers present at FGDs were aware of aspects of the CLCP/SALT process (but not the name/ acronyms used), there were many members of the community who were not aware of the CLCP/SALT process. This perhaps suggests that within village dissemination of the process was not as efficient as anticipated at the start. Villagers who were aware of the SALT process reported benefits both in increasing immunization awareness and service utilization and additional benefits outside the context of immunization.

Conclusions

Community engagement intervention like SALT, in theory, has the potential to improve immunization coverage as it can help identify barriers to vaccination at the local level and thus might lead to customized and sustainable solutions. The findings from this evaluation study based on a cluster randomized controlled trial, however, showed no effect of the SALT intervention on children's immunization coverage in our study population after one year of implementation. After our baseline assessment (June-Aug 2016), we found that all study districts had significantly higher immunization coverage compared to the earlier assessment by NFHS-4 (Nov 2015 – Mar 2016). We postulate that one reason for the improvement in

immunization coverage in both intervention and control villages could be due to the widespread implementation of Mission Indradhanush, the flagship programme of the Government of India, across Assam during the study period. Given the high vaccination coverage in study districts at baseline, the intervention could have been more targeted. The null results from this study suggests that a more targeted approach may be the way forward if SALT has to be effective across various contexts and issues. Qualitative data demonstrated that the CLCP/SALT intervention helped in improving awareness and utilization of services to some extent and had additional benefits outside the context of immunization.

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Abbreviations and Acronyms

ACP	AIDS competence process
ANC	antenatal care
ASHA	accredited social health activists
BCG	Bacillus Calmette–Guérin
CLCP	Community Life Competence Process
cRCT	cluster Randomized Controlled Trial
DLHS	District Level Household and Facility Survey
DPT3	Diphtheria, Pertussis and Tetanus dose 3
FGD	Focus Group Discussion
FIC	Full Immunization Coverage
GVAP	Global Vaccine Action Plan
HHs	HouseHolds
ICC	Intra-Cluster Correlation
KII	Key Informant Interview
KM	Kilometers
MI	Mission Indradhanush
MCP	Mother and Child Protection
NRHM	National Rural Health Mission
OPV3	Oral Polio Vaccine dose 3, or 3 doses
PCA	Principal Component Analysis
RI	Routine Immunization
RSOC	Rapid Survey On Children
SALT	Stimulate, Appreciate, Learn, Transfer
SC	Scheduled Caste
SCs	Sub Centres
SRS	Sample Registration System
ST	Scheduled Tribe
UIP	Universal Immunization Program

1 Introduction

Immunization is a globally accepted public health intervention that helps avert vaccine-preventable diseases. Incomplete immunization and not immunizing increases the risk of illness and death among children. The Global Vaccine Action Plan (GVAP 2011-2020) sets the goal of 90% coverage at the national level and 80% in every district or equivalent administrative unit with all vaccines in national programs by 2020 (WHO, 2013). India is one of the 194 Member States of the World Health Assembly which endorsed the GVAP framework in 2012. Despite a long standing national program for immunization in India since 1985, only 65.2% of 12-23 month old children are fully immunized (RSOC, 2013-14) (UNICEF, 2015). Full immunization is defined as children receiving one dose of Bacillus Calmette–Guérin (BCG) vaccine to prevent tuberculosis, three doses of oral polio vaccine (OPV3), three doses of diphtheria-pertussis-tetanus vaccine (DPT3) or the more recently introduced Pentavalent (DPT-Hepatitis B-Haemophilus Influenzae type B) vaccine, and one dose of measles vaccine. Completion of schedule of vaccines that require multiple doses (e.g., OPV and DPT or Pentavalent) remains a major challenge towards achieving higher full immunization coverage (FIC). Both demand- and supply-side bottlenecks contribute to sub-optimal vaccination coverage rates in India (Vashishtha, 2012, UNICEF India, 2010, Pramanik et al., 2015, Favin et al., 2012, Rainey et al., 2011, Ghosh and Laxminarayan, 2017).

In the context of universal immunization program (UIP) in India, most of the existing interventions are geared towards addressing supply-side challenges such as ensuring better immunization services and more focused implementation by deploying more health workers across health facilities, introducing alternate vaccine delivery system, including new vaccines in the immunization schedule, organizing sessions in hard-to-reach areas, and initiating supplementary immunization activities for children who are missed out in the routine immunization program (Pramanik et al., 2015, MoHFW, 2009, MoHFW, 2015a). But there is a growing body of literature showing that demand-side interventions lead to significant improvement in childhood vaccination coverage in low- and middle-income countries (Oyo-Ita et al., 2012, Johri et al., 2015). Community engagement approaches can address demand-side barriers while also mobilizing the community to advocate for better service delivery (Hahn et al., 2005, Jain et al., 2015). With the growing realization that community-level factors influence vaccination uptake, more recent strategies to increase vaccination coverage have attempted to focus on community-based interventions (Sabarwal et al., 2015, Saeterdal et al., 2014, Oyo-Ita et al., 2016, Owais et al., 2011).

Existing community engagement programs, however, mostly focus on communication activities that do not actively involve communities in the planning, monitoring and surveillance activities (Sabarwal et al., 2015). Participatory engagement of communities can help identify barriers to vaccination at the local level and thus might lead to sustainable solutions in a manner which a top-down approach cannot achieve. Our proposed intervention goes a step beyond merely engaging with communities and strives towards increasing a sense of community 'ownership'.

In various steps of the proposed intervention, referred to by the acronym SALT (Stimulate, Appreciate, Learn, Transfer), the communities lead the way — they identify the challenges, they take actions based on where they are and what they want to achieve, learn from their actions and share their experience with other communities. Trained facilitators stimulate the

communities to leverage their own strengths to address their concerns, and accompany them through a systematic process of learning from action.

This community-based approach has been shown to be effective in generating behaviour change in other contexts. The WHO-UNICEF evaluation of AIDS Competence Process (ACP) in Papua New Guinea (2009) concludes that ACP is an effective approach in combating HIV/AIDS through local empowerment (WHO and UNICEF, 2009). Economic evaluation of ACP in Thailand (2011) shows that it is likely to be cost-effective when comparing incremental cost-effectiveness ratio of the ACP with other HIV prevention programs (Teerawattananon et al., 2011). In the context of malaria, a retrospective study of SALT versus non-SALT districts in Togo shows significant increase in impregnated bednet use and decrease in malaria prevalence among children under five (Legastelois and Forth, 2009). A recent study (unpublished) in Democratic Republic of the Congo found that SALT intervention can reduce resistance to vaccination and increase vaccination rates for oral polio vaccine (Bricq et al., 2015). However, the evaluation design and method used in the study did not measure the attributable impact of SALT.

In the last 5-6 years, according to the different health and demographic surveys, there has been no significant improvement in the FIC in India (UNICEF India, 2010, UNICEF, 2015, IIPS, 2017). It has been suggested that approaches in which communities play a prominent role may be effective for improving immunisation coverage (Sabarwal et al., 2015). We aim to assess the impact of this novel community engagement approach (SALT) in increasing immunization coverage. The objective of this impact evaluation study is to generate high quality evidence that will allow us to causally attribute the changes in immunisation coverage, if any, to the SALT intervention.

We adopted a cluster randomized design with two groups to evaluate the intervention in Assam, a state in the northeast region of India. Our study assessed the intervention's impact on two primary outcomes— full immunization in children 12-23 months old and three doses of DPT or Pentavalent in 6-23 months old children. We considered the following secondary outcomes - dropout between doses 1 and 3 for DPT or Pentavalent vaccine, availability of vaccination card, timeliness of measles vaccination, mother's exposure to immunization messages and mother's belief in community's role in and ability to have impact on her child's health. The evaluation outcomes are aligned with the pre-analysis plan submitted to 3ie. Per 3ie review committee's suggestion, we also examined the effect of the intervention on several water, sanitation and handwashing (WASH) indicators.

The report is organized as follows. Following a brief introduction in section 1, in section 2, we describe the key components of the SALT intervention, including the Community Life Competence Process (CLCP). Section 3 provides the context of selection of study sites which would help readers to assess transferability of the programme and findings. In section 4, the timeline of the implementation and evaluation is covered. In section 5, we describe details of the study design, including data gathering (both quantitative and qualitative), the treatment-assignment and identification strategy, and measures taken to ensure data quality. Section 6 expands on the intervention; how the intervention was implemented in practice, and the process monitoring measures to track implementation of the intervention. Section 7 describes the mixed-methods analyses undertaken to estimate the intervention effect on evaluation outcomes. Sections 8 and 9 describes the main findings. Sections 10 and 11,

cover discussion and policy implications respectively. Additional results and other relevant information are provided in a set of appendices at the end.

2 Intervention, its basic principles and key activities

This community engagement intervention originated at the Constellation, a NGO registered in Belgium. The experience of the Constellation over 12 years in more than 60 countries is that communities can and do respond to the challenges that they face when they take ownership of those challenges. Constellation seeks to accompany the community as it takes the path to ownership of their challenge. The Constellation refers to the methodology used by the community as the **Community Life Competence Process (CLCP)**. Constellation accompanies the community as it applies CLCP with an approach or attitude referred to by an acronym SALT; Stimulate, Appreciate, Learn, and Transfer approach. In this report we have used the acronyms CLCP and SALT interchangeably, and often just the latter.

The foundation of the intervention is that *Communities change themselves. We do not change communities*. The underlying belief being, when a community takes ownership of the challenge that it faces, it is on the road to sustainable change. The intervention uses the Community Life Competence Process (CLCP), a form of learning cycle where a community identifies a problem, makes an action plan, takes action and learns from the process. CLCP is facilitated in communities by trained facilitators who use a mental attitudinal approach referred to by the acronym SALT; Simulate, Appreciate. Learn and Transfer. Through CLCP the community takes action and learns from its experience. That learning becomes the basis for another round of action and learning. The cycle can potentially go on indefinitely in a self-renewing loop with the ultimate goal of promoting community ownership of its issues.

We considered villages in selected study districts as communities for administrative and implementation convenience, e.g., availability of sampling frame for sample selection. In the public health literature of community-based interventions, the term community-based often refers to community as the setting for interventions. As setting, the community is primarily defined geographically and is the location in which interventions are implemented.

The steps of this learning cycle allow a community to divide an apparently insurmountable challenge into a set of specific and manageable steps.

The intervention starts with *home visits* by trained facilitators to villages. Facilitators engage with people, listen to the hopes and concerns of people, appreciate their strengths, and eventually bring the community together to discuss the common values they share. SALT home visits are a crucial starting point as it helps to build trust between the facilitators and the community and to identify strengths available in the community. The next step is collective *dream building* which starts from individuals and small groups and then involves the wider community. In our context, a dream of healthy children in the community and immunization as a component that can contribute to healthy children was considered.

Once the community embraces its dream, a *self-assessment* exercise starts under the guidance of the facilitator, in order to understand where the community stands on the day with respect to practices linked to their shared dream. It is important to note that the practices must ideally come from the community. The facilitators stimulate the conversation so that with respect to healthy children, immunization related practices emerge during self-assessment. The self-assessment framework requires the community to assess itself on the

set of practices defined by the community from level 1 to level 5 where level 1 indicates a low level of competence and level 5 indicates a high level of competence. The central idea behind the self-assessment exercise is that the community assesses themselves, rather than the facilitator assessing them. Thus this is not about an 'expert' coming from outside to assess the community and advise it of its weaknesses or its strengths.

In the next phase, the community chooses three priority practices, relevant to their shared dream, where it feels that it can make progress within a stated timeframe (say, 2-3 months). The discussion evolves around what actions need to be taken (*action plan*) in order to reach a next desired level from the current level agreed by the community during self-assessment. For each selected practice, the community itself comes up with certain number of actions, based on its strengths and resources, which would help them reach the target level within the specified period of time. Often specific individuals or groups are identified from the community who take responsibility for each of the actions. To measure the effectiveness of action plan some indicators are defined by the community members.

This is followed by the *action phase* and the review process. The emphasis is that a plan is used to help take action, with actions taking precedence. Facilitators then bring communities together to share with and learn from each other in a 'knowledge fair' when transfer of knowledge and experience takes place between communities.

Throughout the intervention process the community takes action and learns from its experience. That learning becomes the basis for another round of action and learning. Ideally, the cycle goes on indefinitely: there is no end point. However, for our evaluation project, within the limited timeframe of one year, some communities completed the cycle only once and some others were able to revisit the dream, and the various steps in the process. A pictorial illustration of SALT intervention and its processes are presented in Figure 1.

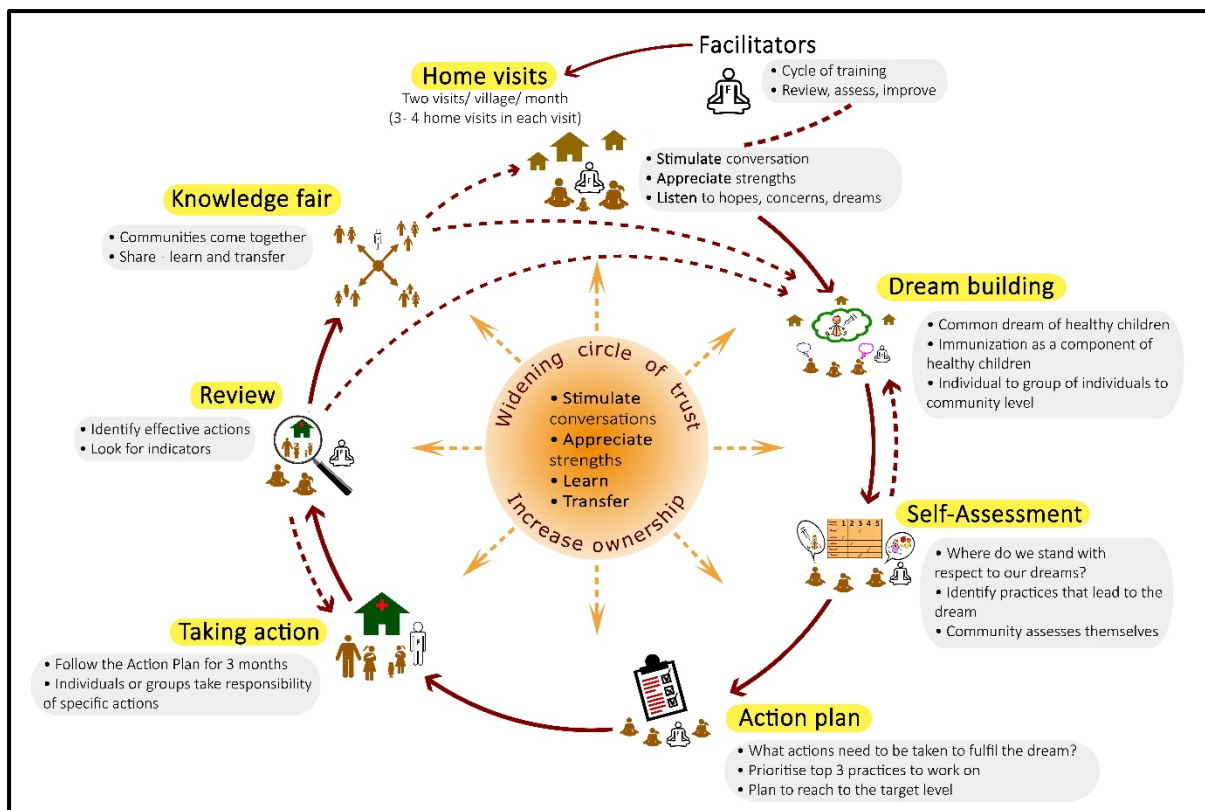


Figure 1: Pictorial illustration of the Community Life Competence Process (CLCP) and SALT: a path to ownership

2.1 Primary outcomes and impacts of interest

The two primary outcomes are full immunization coverage in children 12-23 months old and coverage of three doses of DPT or Pentavalent in 6-23 months old children. We defined full immunization as children receiving one dose of BCG vaccine to prevent tuberculosis, three doses of OPV, three doses of DPT or Pentavalent vaccine, and one dose of measles vaccine. We combined information from the vaccination card and mother's recall to define the vaccination status for each vaccine.

We considered the following secondary outcomes - dropout between doses 1 and 3 for DPT or Pentavalent vaccine, availability of vaccination card, timeliness of measles vaccination, mother's exposure to immunization messages and mother's belief in community's role in and ability to have impact on her child's health. Dropouts between doses 1 and 3 were defined as children who had failed to receive all three doses but had received at least one dose. The vaccination card was defined as available for the child if it was seen by the enumerator. Of the 12-23 months old children with a vaccination card, ones who received measles vaccination between 7 and 12 months were considered to be vaccinated in a timely manner. If the mother had heard, seen or read any immunization messages in the last 6 months then she was considered as being exposed to immunization messages. The mother was asked if she believed that community had a role to play in improving the health of her child and if the community was capable of taking actions to prevent her child from getting sick. If the mother replied 'yes' to both these questions, then we considered her to believe in community's role in and ability to have impact on her child's health.

The WASH outcomes considered were source and handling of drinking water in the household, whether the household has a latrine, and handwashing practices of the mother. A household was defined as having safe drinking water if the household's source of drinking water was 'improved' according to WHO definition of improved drinking water sources, and if water was treated to make it safe to drink and if drinking water was stored in closed containers. The mother was defined as having 'good handwashing practices' if mother reported washing hands with soap or ash after going to toilet and after cleaning a patient or a person who has defecated; and if mother reported washing hands with either soap or ash or water before handling or preparing food, before eating food and before feeding child.

3 Context

The study site is in Assam, a north-eastern state of India. Historically, Assam is known to have poor public health indicators and weak health infrastructure (MoHFW, 2015b). Full immunization coverage in Assam (55.3%) is lower than the national level (65.2%). Dropout rates for vaccines that require multiple doses are higher in Assam than the national figures (UNICEF, 2015). According to the SRS bulletin (2015) (Office of the Registrar General, 2016), Assam has the second highest infant mortality rate in the country, 47 deaths in infants less than a year old per 1,000 live births, which exceeds the national average of 37. We considered 3 districts from Assam- Bongaigaon, Kamrup rural, and Udalguri. Figure 2 shows the location of Assam on India map and the three selected districts on a map of Assam.

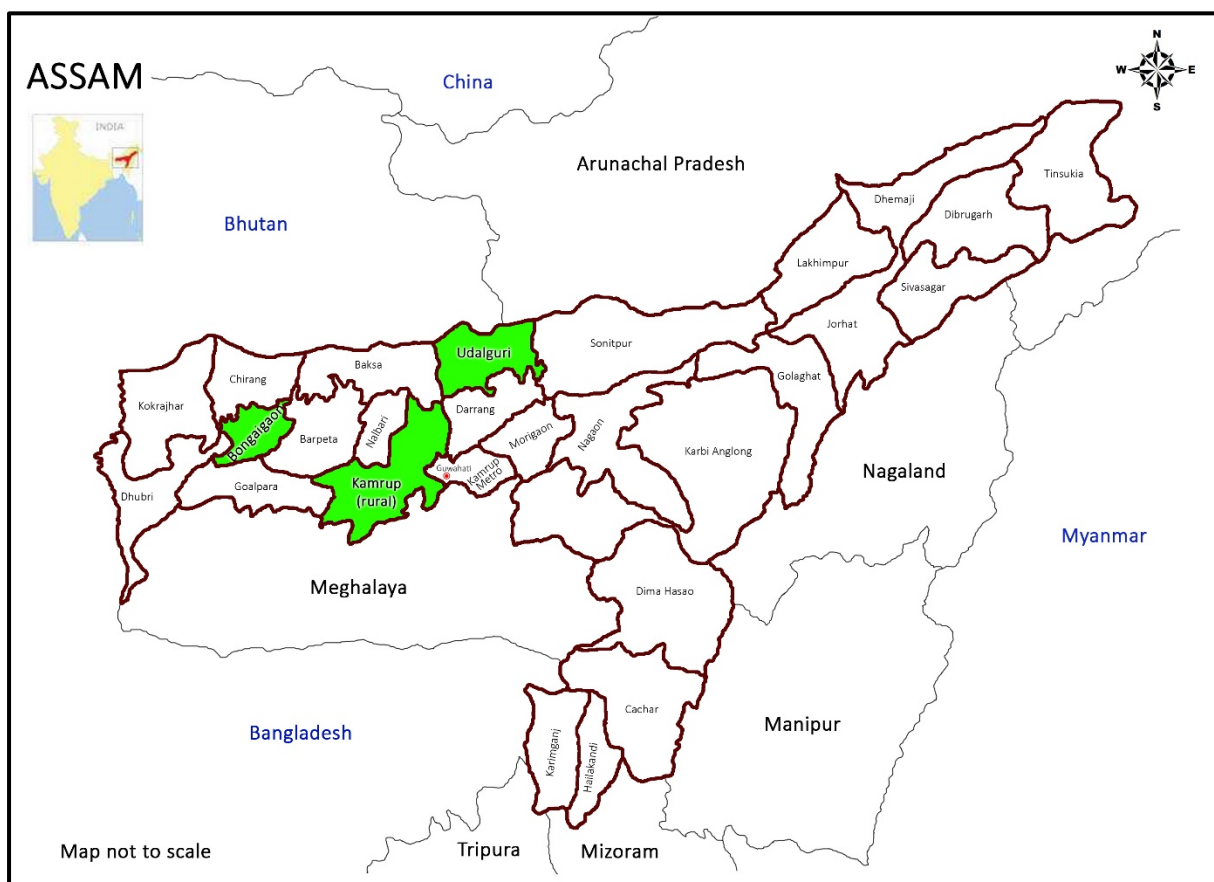


Figure 2: Location of Assam on India map (inset) and three selected districts- Bongaigaon, Kamrup (rural) and Udalguri- on Assam map

Source : <https://www.mapsofindia.com/maps/assam/>

Stratified purposeful sampling was used so that the selected districts represent varied socio-demographic characteristics of Assam. Although stratification was used to ensure representativeness, the districts were purposefully selected so that they were not too far away from the central location Guwahati and were reachable within 3-4 hours by road. This precluded inclusion of upper Assam districts and districts from Barak valley. We excluded two districts from the sampling frame (Dima Hasao and Karbi Anglong) because of safety concerns. Table 1 illustrates the variation across the three districts in terms of selected indicators. We considered only rural areas of selected districts for this impact evaluation study.

Table 1: Socio-demographic characteristics (census 2011) of three selected districts of Assam along with DPT3 coverage rate (DLHS-3, 2007-08)

District	Population	Urban (%)	Tribal (%)	Female literacy rate	Muslim (%)	DPT3 coverage
Bongaigaon	7,38,804	14.9	2.5	64.4	50.2	56.2
Kamrup (R)	15,17,542	9.4	12.0	69.5	39.7	67.2
Udalguri	8,31,668	4.5	32.1	58.0	12.7	62.0

We considered appropriately stratified sampling design to select districts from Assam. Based on 2011 census sampling frame, Assam has 27 districts. We stratified these 27 districts into three strata and selected one district from each stratum. Strata were created based on the composite index constructed using the following district-level indicators: proportion of rural households (HHs), percentage of tribal population, female literacy rate, full immunization coverage rate and proportion of institutional deliveries. The indicators are chosen in accordance with the study objective; either directly related to the primary outcome or determinants of the outcome. First three demographic variables were available from census 2011 and the other two indicators were obtained from the third round of Annual Health Survey (AHS-3, 2012-13). To construct the composite index, we applied principal component analysis (PCA) technique.

Stratification of districts can be loosely defined as dividing districts into three levels of development and selecting one district from each level of development. We believed this stratification strategy would lead to a representative sample of rural Assam, even though a limited number of districts were selected. Hence any inference regarding the impact of the intervention can be generalized for rural Assam.

4 Timeline

In this section, we provide visualisation of the unfolding of the implementation and evaluation in the context of this impact evaluation study. The timeline also includes some of the challenges which lead to minor delays in the project timeline.

Table 2: Timeline of the project: evaluating the impact of SALT intervention in Assam

Activities	2016				2017				2018				'19
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Project initiation formalities: contract signing, hiring new personnel, ethics clearance	█												
First stakeholder meeting in Guwahati to launch the project	█												
Preparation of baseline survey	█	█											
Hiring of survey agency (L-1) for baseline and contract termination ¹		█											
Hiring of L-2 agency for baseline			█										
Baseline quantitative survey			█	█									
Baseline data analysis, revising sample size, randomization post baseline, balance check				█									
Qualitative data collection (FGDs and KIIs) and analysis			█	█	█								
Selection of local NGOs in Assam for the implementation of the intervention in 3 districts			█										
Delay in the start of intervention implementation ²				█	█								
Intervention implementation ³					█	█	█	█	█				
Knowledge fair									█				
Process monitoring and collection of process indicators						█	█	█	█	█			
Publication of study protocol							█	█	█	█			
Endline survey in CAPI										█	█		
Qualitative data collection and analysis											█	█	
Endline data analysis and drafting the final report for 3ie												█	
Submitting of final report and other deliverables to 3ie and manuscript writing													█

¹ due to their inability to deliver as per the expected quality and timeline

² due to concerns regarding FCRA status of SIAAP (the agency which was supposed to oversee intervention implantation and fund management as Constellation does not have a registered office in India). Another agency SAMRAKSHA was hired for this purpose. Individual and institutional contracts were revised.

³ Pace of the intervention got slowed down for couple of months because of lack of cash flow due to PHFI FCRA cancellation, particularly in Kamrup rural and Udalguri

5 Evaluation design and methods

5.1 Ethics approval

The IRB approval (TRC-IEC- 285/16) for the intervention and evaluation component of the study was received from the Institutional Ethics Committee (IEC) of Public Health Foundation of India (PHFI) on 6th April, 2016. Written informed consent was obtained from the participants. However, informed consent to randomization did not happen which does not seem to be a strict requirement for cluster randomized trials as the unit of randomization and the unit of observation are different (McRae et al., 2011). The trial was registered on 7th February, 2017 under the Clinical Trials Registry- India (CTRI), hosted at the ICMR's National Institute of Medical Statistics, and was allotted registration number CTRI/2017/02/007792. A letter of support was also received from the Directorate of Health Services, Assam.

5.2 Evaluation design

We adopted a cluster randomized controlled trial (cRCT) design with two groups to evaluate the intervention. The intervention group received SALT intervention for about a year (March 2017-March 2018) along with the routine immunization (RI) services. The control group received RI services alone. Cluster randomized design is appropriate here as opposed to individual or household level randomization as the intervention is intended for implementation at the community (village) level, the village being our unit of randomization.

The study used a repeated cross sectional design where we tracked the same sampled villages but drew independent random samples of households (HHs) at baseline and endline. Post intervention, for the endline survey we did not follow up the same HHs unlike most other RCTs, as estimating immunization coverage rates requires targeting a particular age-group of children. The children sampled at baseline mostly grew beyond the desirable age limit by the time the endline survey was conducted.

5.3 Sampling design: recruitment of clusters and participants

Within each district, we considered a two-stage cluster sampling design. In the *first stage*, we selected villages (clusters) using a stratified sampling technique. We stratified villages, within a district into four strata and then randomly selected villages from each stratum. For the selection of villages, we used census 2011 village-level data as our sampling frame. The following villages were excluded from the census sampling frame: 1) villages having less than 50 HHs as getting enough number of eligible HHs—having children in the age group 6 to 23 months- would be a challenge and 2) villages having more than 500 HHs as there would be logistics challenges to get the community together for implementation within the timeframe and resources of the study. To stratify the villages, we used the following village-level indicators: population size, percentage of Scheduled Caste (SC), percentage of Scheduled Tribe (ST), and female literacy rate. SCs and STs are various officially designated groups, recognized in the constitution of India, of historically disadvantaged people (NCST, 2006). Based on these indicators we developed a composite index that was then used to construct the four strata based on the quartiles of the index. Twenty villages were selected from each of the four strata using simple random sampling method. The choice of stratified sampling design ensures a representative sample of villages, having varied socio-demographic characteristics, within each district. The requirement of 20 villages

per stratum stems from the sample size calculation, as discussed in the section 5.4 in this report. This led to 80 villages (20×4) in each district, resulting in total 240 villages across 3 districts of Assam for the baseline survey.

In the *second stage*, from all sampled villages, after house-listing a random sample of 15 eligible HHs was selected for the baseline survey. In a selected household, all mothers having children in the age group 6-23 months were eligible to participate in the survey. From mothers, we collected information pertaining to her youngest 6-23 months old child. The flowchart in Figure 3 provides a visual display of the sampling strategy (in blue). In the endline survey, while the sampled villages will remain the same, a new random sample of 15 eligible HHs was drawn from each village. The baseline survey in 240 villages was done during June-August, 2016 and the endline survey was conducted in the same 240 villages after the conclusion of the intervention, during June-September 2018.

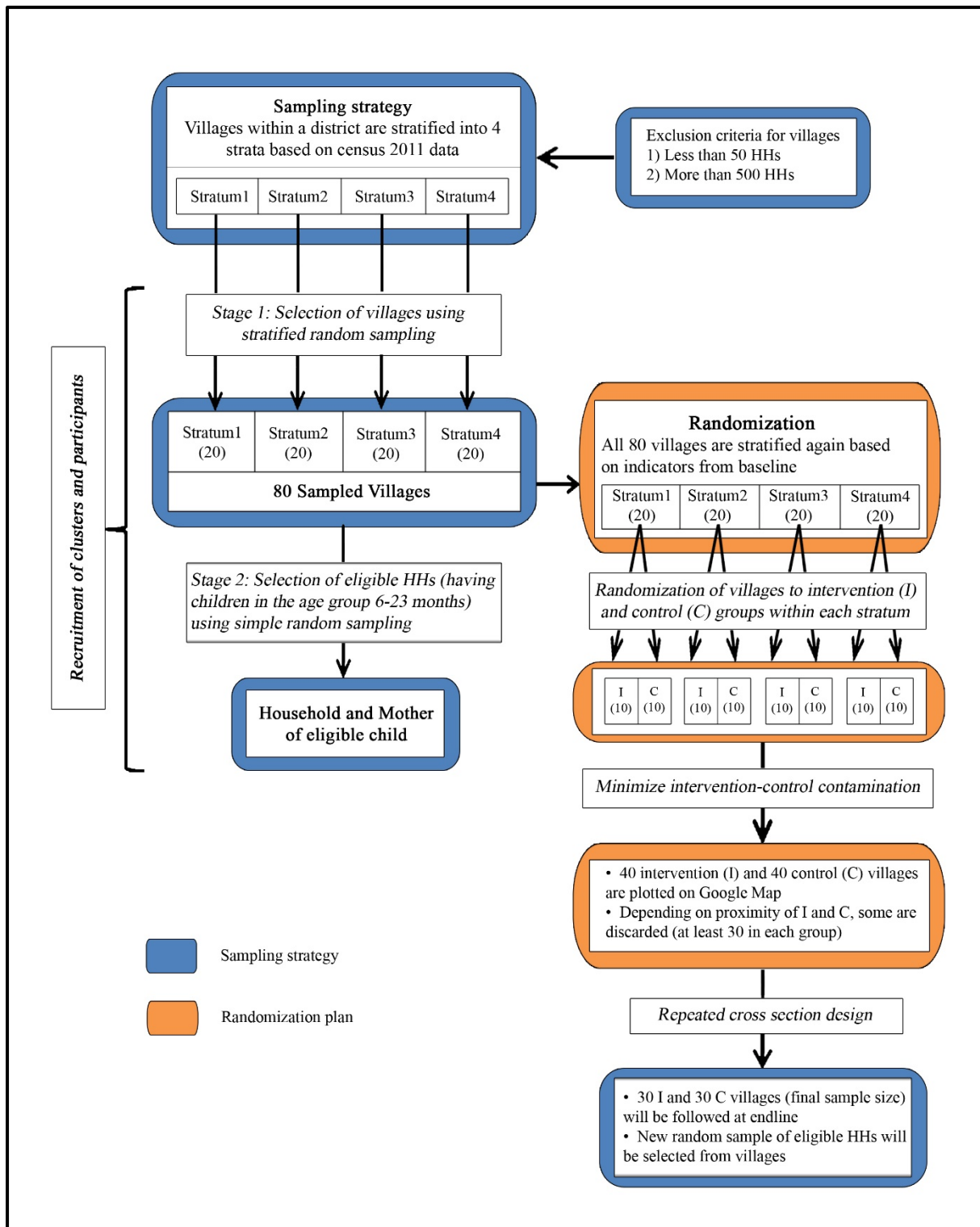


Figure 3: Flow chart describing sampling strategy and randomization plan for the cluster randomized controlled trial within a district: The same flow chart is applicable for all three districts

5.4 Sample size

Sample size calculation for this study evolved over time based on the availability of updated estimates of different parameters involved in sample size calculation. In this section we

present sample size calculation at two different timeframes of the study. Final sample size calculation (Section 5.4.2) suggests a requirement of a smaller sample size for evaluation than what was initially anticipated.

5.4.1 Initial Sample Size Calculation

To calculate the initial sample size, we considered the two primary outcomes: DPT3 coverage among 6-23 months old children and FIC among 12-23 months age group. Per our initial (pre-baseline) sample size calculation, we needed 120 villages per group, intervention and control, leading to a total of 240 villages, to detect a difference of at least 10 percentage points in coverage between the two groups, with 80% statistical power using a two-sided test at 5% level of significance, after accounting for the correlation in immunization status among children from the same village. We considered an equal allocation of 240 villages across 3 districts, resulting in 40 intervention and 40 control villages in each of the selected districts. Estimates of the coverage rate for DPT3 and FIC in the control group were obtained from the most recent data available at the time (RSOC, 2013-14) (UNICEF, 2015). In Assam, the estimates were 65.9% and 55.3% for DPT3 and FIC, respectively. If the coverage rates for DPT3 and FIC in the intervention group are at least 10 percentage points higher, i.e., 75.9% and 65.3%, respectively, our sample size would allow us to detect the difference in coverage rates between the two groups. To calculate the intra-cluster correlation (ICC) for these outcomes, we extracted DLHS-3 (2007-08) (International Institute for Population Sciences, 2010) unit level data for Assam and obtained the estimates as 0.21 and 0.25 for DPT3 and FIC, respectively. We further assumed that a village will have a minimum of 15 children 6-23 months old and 10 children 12-23 months old. If there were more than 15 eligible children in a village, we randomly selected 15 children. Baseline survey was conducted in all 240 villages, as per the requirement of pre-baseline sample size calculation.

5.4.2 Up-to-date ICC and Re-estimation of Sample Size

Sample size is sensitive to the estimate of intra cluster correlation (ICC) used in the calculation. ICC, often interpreted as the degree of homogeneity of units within cluster with respect to the outcome variable, is defined as the ratio of between-cluster variability to total variability in the outcome. ICC estimates used in the pre-baseline sample size calculation were based on DLHS-3 (2007-08) data. We expected the recent ICC estimates for DPT3 and FIC to be different, most likely smaller in magnitude because of the improved reach of maternal and child health services, including immunization, under the National Rural Health Mission (NRHM, 2005-2012) (NRHM, 2005). Immunization service delivery, supply chain system, vaccine logistics and the process of linking health system and communities through ASHA- all these have been standardized to a large extent in all rural areas. Moreover, we considered that the estimates for coverage rate for DPT3 and FIC may have also changed. These changes would affect the sample size needed to detect a difference in coverage rates between the control and intervention groups.

On another note, our intervention is complex in nature, involves sustained interaction over several months with the community. Owing to this intense nature of the intervention, there were concerns that implementation of the intervention may not happen optimally within the timeframe and budget if the sample size was unnecessarily large. The international panel of reviewers of this study also recommended that the sample size and ICC be recalibrated based on new data that would become available to us from the baseline survey. These considerations led us to recalculate the sample size based on estimates derived from baseline data.

Table 3: Final sample size requirement for two primary outcome variables: calculated using SALT baseline survey (July-August 2016) data

Outcome of interest	Updated coverage rate (%)	Updated ICC	Updated sample size (villages in each group)
DPT3	84	0.17	57
FIC	79	0.18	90

Table 3 presents the revised estimates based on data from baseline survey and the revised sample size. Note that the ICC estimates based on baseline data have decreased relative to earlier estimates from DLHS-3, as anticipated. On the other hand, vaccination coverage rates have increased substantially relative to RSOC data (2013-14). This sudden increase in vaccination coverage can perhaps be attributed to Mission Indradhanush (MI), a flagship program of the Ministry of Health and Family Welfare (MoHFW) and was also observed in other historically poor-performing states such as Bihar, Rajasthan and Madhya Pradesh (Pramanik, 2016). Two phases of MI happened before our baseline survey (phase 1: April-July 2015 and phase 2: Nov 2015-Feb 2016) and all three study districts (Bongaigaon, Kamrup rural, and Udalguri) received at least one round of MI intervention. However, it was possible that this high level of immunization coverage would not be sustained in future after the supplementary immunization activities under MI are discontinued. In view of these high coverage rates, we reduced the minimum detectable difference from 10 to 8 percentage points in the revised calculation of sample size.

Per our revised sample size calculation, we needed 90 villages per group to detect a difference of at least 8 percentage points in coverage between the control and intervention groups with 80% statistical power based on a two-sided test having 5% level of significance, after accounting for the correlation in immunization status among children from the same village. Total number of villages required for the study was 180 (90×2). We considered an equal allocation of 180 villages across the 3 districts, resulting in 30 intervention and 30 control villages in each of the three selected districts. The intervention was implemented in 90 villages across 3 districts. However, endline data were collected from all 240 villages (120 intervention and 120 control) where the baseline survey happened before the launch of the intervention.

5.5 Randomization strategy

We adopted a restricted randomization strategy, specifically stratified randomization, to achieve better balance, leveraging information available to us prior to allocation. As opposed to a complete randomized allocation, stratification has the potential to provide explicit balancing of potentially important covariates known to be associated with coverage outcomes, as randomization happens within each stratum (Donner and Klar, 2000).

All 240 villages sampled in the baseline survey were randomized to the intervention and control groups. For our stratified randomization strategy, the key advantage of randomization post-baseline survey is that the stratification of villages, and subsequently randomization within stratum, can be based on up-to-date indicators obtained from the baseline data.

Sampled villages from baseline survey, within a district, were stratified into four strata based on a composite score constructed using the following village-level indicators: average number of under-5 children, percentage of HHs living for more than 50 years in the village, percentage of SC HHs, percentage of ST HHs, percentage of Muslim HHs, percentage of HHs belonging to the poorest wealth quintile, percentage of HHs belonging to the richest wealth quintile, percentage of mothers having no formal schooling, percentage of mothers with educational qualification higher secondary (HS) or more (12 years or more), percentage of mothers receiving full antenatal care during pregnancy, village had flood last year or not. Full antenatal care (ANC) is defined as consumption of IFA tablet/syrup for 100+ days, 3+ antenatal check-ups visits, and receipt of at least one TT injection. These indicators were derived based on data from baseline survey.

All indicators were not used for stratification within a district, the choice of variables depended on the district-specific context. For example, in Kamrup rural, all three socio-demographic indicators—percentage of SC HHs, percentage of ST HHs, and percentage of Muslim HHs, were considered whereas for Bongaigaon percentage of ST HHs was not relevant and for Udalguri only percentage of ST HHs was relevant.

To define economic indicators, wealth index was constructed for each household using baseline data. Wealth index is a widely accepted measure of household's long term economic status (Rutstein et al., 2004, Filmer and Pritchett, 2001). To construct the wealth index, we considered variables related to housing characteristics, sanitation facility of the HH, and asset possession. Each variable is assigned a weight generated through principal component analysis (PCA) and the standardized variables are multiplied by the weights and summed to produce the wealth index. The first principal component, explaining 25% of the total variation in the data, was considered as the wealth index. Based on the wealth index the HHs were divided into quintiles: poorest, poorer, middle, richer, and richest.

Finally, within each stratum we randomized sampled villages to intervention and control groups. After stratification within a district, each stratum contained 20 villages as the baseline sample covered 80 villages in each district. We randomly selected 10 villages to receive the intervention and the remaining 10 villages will continue to receive immunization services from the routine immunization program in place (control group). The flowchart in Figure 3 illustrates the randomization procedure (in orange). R statistical software was used to implement the randomization strategy through the use of random numbers (R Core Team, 2014a).

5.5.1 Minimizing Intervention-Control Contamination

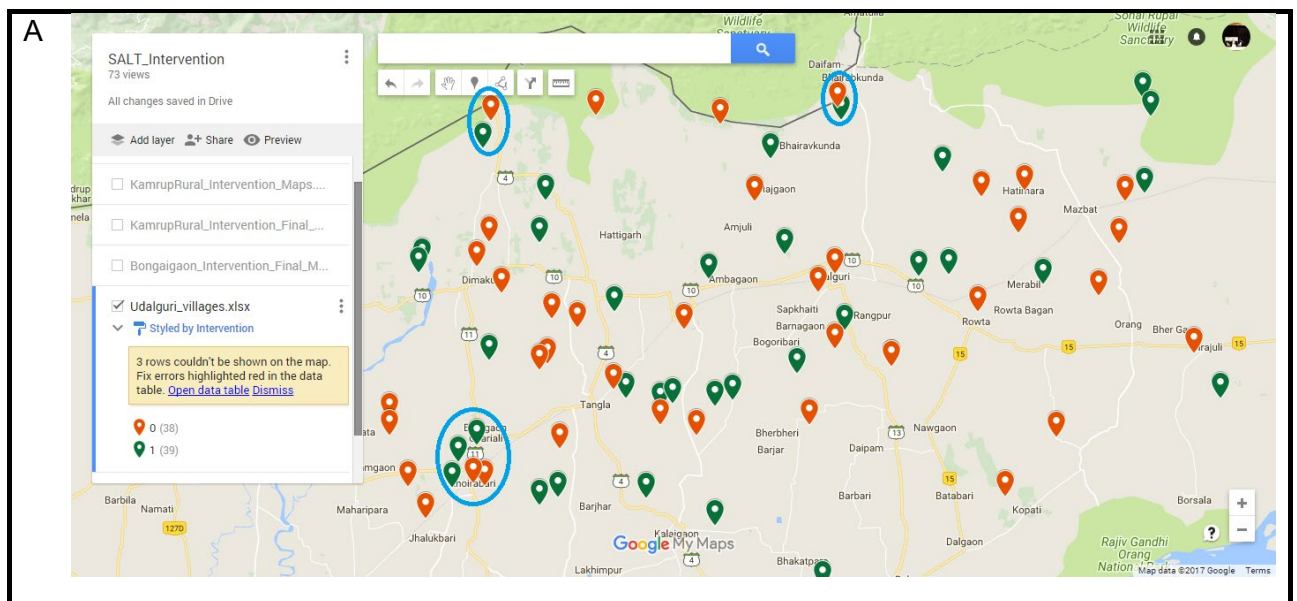
In each district, we had randomized the 80 sampled villages to the intervention and control groups in equal proportion. However, according to our revised sample size calculation, we needed only 30 intervention and 30 control villages, that is, we had the liberty to exclude 10 villages from each of the two groups. We attempted to use this opportunity to minimize intervention-control contamination while excluding villages, as opposed to random exclusion.

Transfer of knowledge is an important component of the SALT intervention. Particularly, during the knowledge fair, the community may have an opportunity to meet peers from the control community and share their knowledge and experience, in case intervention and control villages are located in close proximity. To mitigate potential contamination between intervention and control villages, we attempted to ensure that the intervention and control villages are sufficiently far apart from one another. By separating the intervention and control

villages geographically we sought to reduce the chances of interaction between community members belonging to the intervention and control groups. The following procedure was used to ensure geographical buffer between the intervention and control villages.

After randomization, we plotted the intervention and control villages on Google Maps by uploading an excel file of villages having locations (defined by “village name, district name, state name”) as a column. Different-color place marks were used for intervention and control villages. Using features of Google Maps, we then calculated straight line distances between intervention and control villages when they visibly appeared to be close by. If the distance was less than 3 kilometers (KM), we discarded one of the villages. While discarding villages, we were mindful about two things: 1) an equal number of intervention and control villages are being discarded and 2) distribution of intervention and control villages across strata does not change significantly as that might have an impact on balance between the two groups.

Figure 4 illustrates the procedure using two Google Maps screenshots. In Panel A, we plot all 80 villages from Udalguri district that were randomized to intervention (green) and control (red) groups and in Panel B, we present the same plot after discarding villages in instances where intervention and control villages are within 3 KM distance. For example, in bottom left corner, two control villages appeared to be located in close proximity to three intervention villages. Distance calculation confirmed that the straight line distance is less than 3 KM and, hence, two control villages were discarded (circled in blue in Panel A and B). Using the same rationale, two intervention villages were also discarded as seen in the top left and top middle part of the plot (circled in blue in Panel A and B).



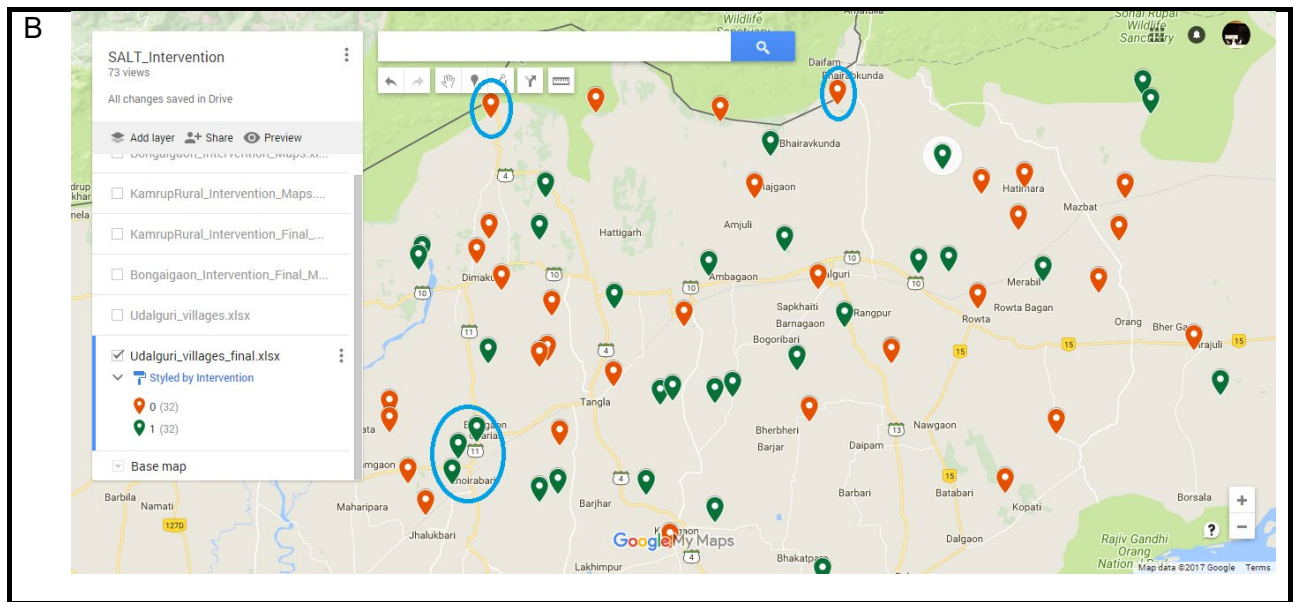


Figure 4: Screen shot of intervention (green) and control (red) villages in Udalguri: Potential scenarios of intervention-control contamination and subsequent use of geographical buffer to minimize it. Panel A: Original randomization of baseline survey villages. Panel B: After discarding villages when intervention and control villages are within 3 KM distance.

Source: Google Maps.

5.5.2 Balancing Checks

Balance between intervention and control groups was examined with respect to potentially important covariates after randomization of the 240 villages using baseline data. Although randomization happened at the village level, the unit of analysis is the child. Hence, we performed balancing checks at the level of village, child, child's household and the mother. Balance was re-examined after excluding the villages discarded to minimize intervention-control contamination. Results in Table 4 suggest that reasonably good balance has been achieved across indicators for villages, children, their HHs, and mothers. This is expected as the randomization of villages to intervention and control groups happened within stratum, after stratifying the villages based on several of the indicators presented in Table 4. The two groups remain balanced after excluding intervention and control villages discarded to minimize intervention-control contamination.

To check balances between intervention and control groups based on selected household, mother and child level characteristics we have adjusted for clustering as responses from HHs (as well as mothers and children) within a village are correlated. However, for checking balance based on village level indicators this adjustment does not have any impact on standard errors and hypothesis testing. All analysis has been done using "survey" package (Lumley, 2011) in R (R Core Team, 2014b). Wilcoxon rank sum test has been adjusted as per the survey design (Lumley and Scott, 2011).

Table 4: Balancing checks based on selected village, household (HH), mother and child-level indicators: comparison between intervention and control groups

Characteristics	<i>After randomization of all 240 baseline survey villages</i>			<i>After discarding villages to minimize contamination (180)</i>		
	Control	Intervention	p-value	Control	Intervention	p-value
<i>Village-level indicators</i>						
Having sub-centre	40.5	39.2	0.8334	39.8	41.7	0.7926
Having secondary school	31.0	25	0.3034	29.6	26	0.5833
Occurrence of flood last year	30.2	37.5	0.2359	31.6	35.4	0.5787
% of HHs living more than 50 years in the village	75.9	76.5	0.6841	77.2	76.1	0.8800
% of tribal HHs	26.4	26.2	0.5359	25.6	27.3	0.6494
% of mothers with education HS or more	12.3	13.1	0.6777	12.6	13.6	0.6390
% of mothers receiving full ANC	41.9	42.1	0.936	42.5	43	0.8386
<i>Household-level indicators</i>						
Average HH size	5.33	5.28	0.4336	5.34	5.3	0.4867
HH head is Muslim	27.9	32.3	0.4104	27.7	30.2	0.6453
HH has (pour) flush toilet	35.9	33.6	0.5033	35.3	35.1	0.9965
HH belongs to poorest wealth quintile	19.7	19.7	0.9838	20.4	17.3	0.2405
Average time (in minutes) from HH to vaccination site	19.9	20.6	0.5764	19.9	19.9	0.6037
<i>Mother- and child-level indicators</i>						
Mothers received full ANC	41.9	41.9	0.9612	42.4	42.9	0.8787
Child was born in health facility	85.9	86.5	0.7941	84.9	88.4	0.2184
Child has vaccination card	92.7	92.4	0.7852	92.1	92.1	0.9731
Child (12-23 month) is fully immunized	78.5	77.6	0.8244	77.6	77.6	0.8479

Note: Wilcoxon Rank Sum Test of Null Hypothesis: location parameters of the distribution are the same in each group

5.6 Data collection and data quality control measures

5.6.1 Quantitative data collection

The process of endline survey data collection started with selection of the data collection agency. Based on their performance during the baseline survey, Nielsen (India) Pvt. Ltd. was selected for conducting the endline survey. Computer assisted personal interviewing (CAPI) mode of data collection was used to collect data. Nielsen was found to be experienced in managing large scale studies on CAPI across India including Assam.

The survey comprised of two stages, a houselisting exercise followed by a household survey of mothers. For the main survey, the CAPI program developed by the Nielsen team was tested multiple times and subsequently revised based on the feedback from the evaluation team. The CAPI program was also field tested in mid-July. Based on the feedback received from the field monitoring reports and a series of feedback sessions involving the evaluation team and the Nielsen team, the final version of the CAPI program was developed on 25th July, 2018. The quantitative survey started towards the end of July, 2018 and continued till the second week of September, 2018. Nielsen maintained an effective communication channel throughout the course of the endline data collection thereby ensuring that the feedback provided by the evaluation team, based on field monitoring reports and analysis of real-time data was conveyed to the entire field team. Nielsen also shared the field plans with the evaluation team in advance on a regular basis which helped the evaluation team in planning the field monitoring better.

Nielsen employed 21 interviewers and eight supervisors. Their work in the field was closely monitored by the IIPH-Shillong monitoring and evaluation (M&E) team. Each of the field interviewers and supervisors was monitored at least once. Interviewers/ supervisors who required more handholding were monitored more (3-4 times) than the others. A monitoring plan and grading format for the interviewers and supervisors were developed to evaluate interviewing/ supervising skills and attitude. The M&E team accompanied the survey data collectors and their supervisors and observed them closely in the field. Feedback reports were prepared on the same day and sent to the PI and Co-PIs by the end of day, who in turn went through the reports, before sharing feedback to the survey agency for continued improvement.

The evaluation team faced several difficult circumstances during the endline survey monitoring such as lack of motorable roads which resulted in both the survey and evaluation teams walking several kilometres and using country boats to reach the selected village. Despite these challenges, the team monitored 23 villages across the three districts and ensured that the interviewers understood the content of the questionnaire and followed proper interviewing technique to collect data.

We received the data sets from the survey agency Nielsen twice a week in both SPSS and STATA format. To check data quality and ensure internal consistencies in data, we developed 27 parameters covering both household and mother questionnaires. But our main focus was on the following four indicators which were related to our primary evaluation outcomes.

1. Whether the images of the vaccination cards were captured or not by the interviewers (for children having vaccination cards and cards being seen by interviewers).

2. Comparison of the vaccination dates entered by the interviewers with the information captured in the images of the vaccination card.
3. Time taken to complete the household and mother questionnaires across interviewers (whether some interviewers are always rushing/ unrealistically slow).
4. In mother questionnaire, we wanted to investigate whether the order of different vital events is reflected in the data or not. In other words, mother's age > mother's age at first birth > mother's age at marriage is followed or not.

These indicators were checked regularly and feedback based on data analysis was shared with the survey agency. To ensure quality of our primary outcome data, we matched the immunization data recorded from the card with the vaccination card image. We calculated the status of primary evaluation outcomes (full immunization and DPT 3 doses) independently from the images of the vaccination card and the dates recorded by interviewers for randomly selected 137 children. Only one discrepancy was noted in the full immunization coverage status and no discrepancy was noted for the coverage of three doses of DPT.

5.6.2 Qualitative data collection

Qualitative data was collected to understand community perceptions regarding immunization and the SALT intervention from 28 villages (22 intervention and 6 control villages).

Methods of data collection adopted included 1) Focus Group Discussions (FGDs), 2) Key Informant Interviews (KIIs) and 3) In-depth Interviews (IDIs). A total of 39 FGDs were conducted across the 3 study districts with parents (mothers and fathers separately) and grandmothers of children in the age group of 6-23 months. Twelve IDIs were carried out with parents and grandmothers in Kamrup and Bongaigaon districts. IDIs were initially not a part of qualitative data collection plan, but in certain instances where adequate number of participants did not turn up for FGDs, the research team conducted IDIs. In addition, 33 KIIs were carried out across the three study districts. The KIIs were conducted with the District Programme Manager (DPM) and Block Community Mobilizer (BCM) of National Health Mission (NHM), Auxiliary Nurse Midwives (ANMs), Accredited Social Health Activists (ASHAs) and ASHA Supervisors; see Table 5. Other than a few KIIs (e.g., with DPM) where some of the conversation happened in English, all other qualitative data collection methods used local language only.

Table 5: List of different qualitative data collection methods along with sample size across study districts

Districts	In-depth Interviews (IDIs)				Key Informant Interviews (KIIs)						Focus Group Discussions (FGDs)			
	GM	MO	FA	Tot	ASHA	ANM	Asha Sup.	BCM	DPM	Tot	GM	MO	FA	Tot
Kamrup	7		1	8	8					8	3	9	1	13
Bongaigaon		4		4	9	1	5	1	1	17	4	8	3	15
Udalguri				0	8					8	2	8	1	11
Total	7	4	1	12	25	1	5	1	1	33	9	25	5	39

Note: GM: Grandmother; MO: Mother; FA: Father; Tot: Total

Interview topic guides were used to conduct FGDs, KIIs, IDIs. The topic guides included questions about perceptions of a healthy child, common childhood ailments and corresponding treatment seeking behaviour, knowledge and perception of vaccination, and any challenges faced in vaccinating children. In intervention villages participant's opinion regarding different steps of SALT process starting from the dream building, self-assessment, action plan, taking action, and whether any transfer of information among the community or the villagers has taken place was probed.

The FGDs, KIIs and IDIs were recorded with prior consent of the respondents. The interviews with rich information were prioritized for in-house translation and transcription into English by the study team, while the remaining files were outsourced through Earth Lingua, a translation and transcription agency.

The field research team was well versed in Assamese as well as English. They cross checked randomly selected 15% of the tapes and verified with the transcripts as a quality check.

6 Intervention implementation and process evaluation

6.1 Implementation of the intervention in practice

6.1.1 Selection of local NGOs for intervention implementation

Constellation engaged two local NGOs, viz., Voluntary Health Association of Assam (VHAA) and Centre for North East Studies and Policy Research (C-NES) for implementing the intervention. C-NES was responsible for implementing the intervention in Bongaigaon district while VHAA implemented the intervention in Kamrup (R) and Udalguri. In order to select the local NGOs, the Constellation Team visited Assam in June 2016 to have a first-hand experience about the activities of the short-listed NGOs. The evaluation team provided support in the selection process and shared insights based on their experience regarding the short-listed agencies. The Constellation used the following criteria while selecting the NGOs:

- Experience and willingness to work with the community
- Are they interested in SALT approach?
- Experience of working under different context and issues, particularly within health sector
- Infrastructure of the NGOs
 - How they execute their on-going projects
 - The strength of the finance team, advocacy team and communication team
- Their relationship with the Government
- Whether the NGOs have FCRA or not

Each of the selected NGOs engaged three SALT facilitators for a district, each facilitator having responsibility of implementing the intervention in 10 villages. In total nine SALT facilitators were engaged for implementing the intervention. C-NES hired an additional district coordinator based in Bongaigaon for coordinating the intervention. The VHAA district coordinators were based out of Guwahati. The SALT facilitators and district coordinators were trained on the SALT approach during the course of the intervention (Feb 2017- April 2018).

6.1.2 First learning event

The implementation of the intervention kick started with the first learning event organized by Constellation along with the local NGOs from 13th -18th February 2017. Constellation coaches Ian Campbell, Rituu Nanda, and Bobby Zachariah took the lead in conducting the learning event. A team of facilitators from VHAA and C-NES along with the district coordinators participated in the event. From the evaluation team the PI, Co-PIs, Senior Program Assistants, Research Fellow and Research Assistant were also present. The teams were introduced to the concept of SALT (Stimulate, Appreciate, Learn, and Transfer) intervention, its basic foundations and the process of home visits. 'SALT home visits' was described as a crucial starting point for rapport building between the facilitators and the community and to identify the strengths of the community. The event included interactive training sessions and hands on experience through home visits made to the selected villages in the three study districts Kamrup Rural, Bongaigaon and Udalguri. The evaluation team members played an active role in translating (English to Assamese) the session proceedings and explaining the content to the facilitators. Four villages were selected for demonstration of home visits. These are Barkukuria village in Kamrup rural, riverine village Chatpara, Pachonia part 1 in Bongaigaon, and Saikiapara village in Udalguri. The teams used C-NES boat clinic to reach Chatpara village.

6.1.3 Subsequent learning events and support visits

After the first learning event in February 2017, Constellation team organized subsequent learning events and support visits to explain the different steps of the intervention to the facilitators. In March 2017, Jean-Louis Lamboray and Rituu Nanda visited Guwahati to meet the local implementation teams. Although the primary objective of this visit was to launch Jean-Louis's recent book '*What makes us human?*' in Guwahati, Constellation coaches took this opportunity to expand on the concept of Community Life Competence Process (CLCP) and also to understand the challenges faced by the facilitators during home visits.

A 5-day learning event was conducted again in June by Marlou De Rouw, Bobby Zachariah and Rituu Nanda. Three coaches from Constellation leading three field-teams in Bongaigaon worked well and acted as morale booster for the teams. There was noticeable improvement in facilitation skills among facilitators, especially those who had difficulties in communicating and facilitating during the first learning event.

Learning event from 8th -9th July was conducted by Constellation coaches Philip Forth and Rituu Nanda. During the learning events in June and July, the concept of CLCP and the steps involved in it like dream building, self-assessment and action planning were explained in detail. The visit by Phil Forth was particularly noteworthy, as during this visit a more comprehensive approach to outlining the CLCP/SALT approach was done, while a more incremental approach was used in previous visits. Thus in the latter visit facilitators got a clearer picture of the entire intervention. The local facilitators also gave valuable feedback to the lead facilitators on how their training could have been improved.

In October 2017 (4th- 7th Oct), Luc Barriere Constantin and Rituu Nanda made another support visit to explain and illustrate the action plan step of CLCP in detail. There were dedicated sessions to understand the challenges faced by the facilitators and what they are

doing to overcome the challenges in the field. During this support visit there were comprehensive inter-district discussions which led to exchange of ideas and learnings like:

- a. Inclusion of champions in the facilitation work (e.g., for conducting dream building, self-assessment and action plan)
- b. Inclusion of champions or any other interested person from the community in After Experience Reflection (AER) process, which is commonly performed by the SALT facilitators
- c. Pasting a copy of dream building, self-assessment and action plan charts in a common community space
- d. Conduct a district level meeting with ASHA and ASHA supervisors for smooth implementation of the intervention
- e. Inviting BCMs and other health officials during community meetings
- f. Formation of small groups (Action Implementation Group-AIG) during action plan if the community wants as it happened in Boinashri village of Udalguri. This group will regularly meet with the responsible/ concerned person for a specific activity and follow up on progress or problems.

The key points that were discussed for each of the steps involved in CLCP are as follows:

Dream building

1. Ask the question: What is your dream (as a community/individual) for health of children in your community in 10 years?
2. Build share the individual dream
3. Divide the people into small groups (Men/women/children/youth)
4. Facilitate the development of the group dream
5. Discuss all the group dreams to develop a common dream for the community
6. Document the common dream pictorially and in writing
7. Document the ideas of change that emerge
8. Carry out AER to discuss what went well in the facilitation team, what could have been better and how did they do as a team

Self-assessment

1. Self-assessment is an exercise done by the community to assess where they are now in terms of achieving their dream or a desired level. It is the community that assesses themselves and not the facilitator.
2. The practices should begin with “We...followed by an active verb”
3. The self-assessment exercise is time consuming and challenging for the community to understand and so the facilitator should not rush the process. The community should be given enough time to understand the levels of self-assessment.
4. If the self-assessment exercise is carried out in two days, then on the second day summarize/explain what was done on the previous day.
5. For the ease of facilitation, the facilitator should carry the chart of the common dream of the community, a few charts of the home visits made in that village, a chart with the self-assessment framework drawn and extra blank charts and pens
6. The community can be divided into groups for listing the key practices but not for assessing the levels of self-assessment.
7. Apply the principles of SALT: Stimulate, Appreciate, Learn and Transfer while facilitating the discussion/conversation with the community.

8. Carry out AER with yourself/fellow team members after completing the exercise for the day.

Action plan

1. The facilitators will facilitate a dialogue through which the community chooses three practices which are feasible and doable in a specified period of time (2-3 months) from the practices selected by the community during their self-assessment. From the desire for healthy children. The facilitator should facilitate such that the community picks up the practice of immunization as one of the three practices in their action plan. All the selected practices are to be listed on the action plan chart.
2. The facilitator should link the community with necessary individuals or organizations and not provide any immediate solutions to the community.
3. AER should be conducted after completing the action plan and members of the community and health workers can be included in AER.

6.1.4 Knowledge Fair

Knowledge Fair is the last component of the CLCP process where the communities share their experiences and learn from each other. Knowledge Fairs were organized by the Constellation and its local partner organizations in the three districts in April, 2018. This was followed by a combined Knowledge Fair in Guwahati where communities from the three districts came together. The objectives of the Knowledge Fair were to bring together communities from the project districts to connect for cross learning and inspiration and to get new perspectives from the experiences shared. The Evaluation team members attended these sessions as observers.

6.2 Process evaluation of the intervention

In order to measure the extent of community's exposure to the intervention we collected process indicators throughout the intervention phase. Specifically, the aim was to gain understanding about the intervention fidelity around the following aspects: 1) whether the intervention was implemented as intended, 2) whether the intervention incorporated the primary objective of the study (that is, increasing immunization coverage), 3) consistency of intervention delivery across communities in terms of the process of administering the intervention, 4) the reach and coverage of the intervention across villages and districts, and 5) whether contextual factors influenced the implementation of intervention.

The components of the process evaluation were developed based on the framework of Grant et al (Grant et al., 2013). Data on the indicators relevant for each step of the intervention were collected through a combination of methods, including monthly reporting format developed by the evaluation team and duly filled in by the SALT facilitators, direct observation of different steps of the intervention by the evaluation team, and in-depth interviews of SALT facilitators and district coordinators by the evaluation team. The team also interacted informally with community members during the dream building, self-assessment, and action plan sessions in the community.

6.2.1 Development of process evaluation indicators and monthly reporting format

It was agreed that some indicators would be documented by facilitators, compiled by the lead NGO and shared with the evaluation team. To develop the indicators for process evaluation, the evaluation team first reviewed the existing literature and identified key indicators used for evaluation of complex interventions in a randomized evaluation set-up.

While developing the indicators, the various steps involved in the SALT intervention were kept in mind. After multiple iterations, the final set of indicators were included in the monthly reporting format and shared with the local implementation agencies C-NES and VHAA. The idea was to keep the format simple so that it was not a burden for the facilitators to fill it on a regular basis. After a series of meetings through Skype/phone/in-person, a simple monthly reporting format with the following indicators was developed in July 2017:

- Total no. of HHs (as per house-listing data) in the village
- Number of visits made to this village
- Total no. of HHs where SALT visits were conducted
- Total no. of community meetings that happened
- Total no. meetings involving specific groups (e.g. CBOs/ SHGs/ Health workers/religious leaders/others)
- Has the community dream building happened in this village (if yes, specify month)?
- Did immunization emerge as a topic during dream building?
- Has the self-assessment exercise happened in this village (If yes, specify month)?
- Were practices around immunization discussed during self-assessment?
- Did the community develop an action plan based on 3 practices?
- Duration (in months) of action phase in the village
- No. of follow up visits made to the village for follow up of action plan

Once the monthly reporting format was finalized, the process evaluation team conducted a two-hour training session during Constellation's learning event in July 2017, explaining the indicators and how to fill them.

All nine SALT facilitators used to submit filled-in monthly reporting formats to the evaluation team after the end of each month more or less in a timely manner. Based on the monthly reports from SALT facilitators, the evaluation team created consolidated reports at the district level. District-wise village-level process indicators are included in Appendix C.

6.2.2 Development of process evaluation data collection tools

Based on the concepts learnt from the learning events and other support visits of Constellation, the evaluation team developed checklists for on-site process monitoring of home visits, dream building, self-assessment and action plan (0). The checklists have indicators to understand and document the "what, where, when and how" aspect of implementation of the intervention. Furthermore, to understand the implementation of the intervention through the lens of the facilitators, in-depth interviews (IDIs) were conducted with SALT facilitators and district coordinators. IDI guides were developed for the ease of conducting interviews (Appendix E). These guides have questions that not only help to cross verify some of the indicators of the monthly reporting format but also help to get a better understanding of the ground realities pertaining to the intervention.

6.2.3 Process evaluation data collection

After developing the tools for process evaluation data collection, the evaluation team began data collection from June 2017. Each facilitator and district coordinator was interviewed twice in person during the intervention phase. In addition, one-to-one follow up was done over phone and WhatsApp in order to resolve confusion. The interviews were conducted in Assamese language and were audio recorded. The audio-recordings were transcribed into English and further analyzed. The team also conducted informal interactions with

community members just after the the dream building, self-assessment and action plan sessions.

6.2.4 Key observations based on process evaluation data

Some overall observations as well as specific observations related to SALT facilitators, trainers and community members are outlined below.

Overall observations

- **Progress and completeness:** In 88 of the 90 villages the entire intervention was completed before end of the intervention period (March 2018). Bongaigaon district largely followed the implementation plan as outlined within the timeline. Dream building (DB) and self-assessment (SA) were completed in 90% of the villages by December 2017 and the full cycle of CLCP was completed by March 2018. In Kamrup rural DB & SA were completed in 23 of the 30 villages by December, 2017 and the full intervention was done in 28 of the 30 villages by March 2018. In two villages, the intervention was not completed within the stipulated time. In Udalguri district DB & SA were completed in 23 of 30 villages (76%) of the villages by December, 2017. And the whole intervention was done in all 30 villages by March 2018 with 4 villages getting the different phases of CLCP (dream building, self-assessment, action plan and action phase) within a period of one month (March 2018).
- **Who is exposed to the intervention?** Generally, 10-30 community members participated in the CLCP activities (e.g., dream building, self-assessment, action plan and follow-up) under the SALT intervention. It was observed that there was no mechanism in place for tracking whether the same participants participated in all the activities under SALT. For example, in many cases it was evident that people who were present during the dream building exercise were not part of the subsequent sessions (self-assessment/ action plan/ follow-up) and also some new members joined in each subsequent activities. An assumption at the start was that intra-village transfer of SALT would take place but this did not appear to be the case as the new members who were present during later steps/processes were often unaware of the previous activities (observation by M&E team).
- **Duration of intervention:** Each of the key SALT activities such as dream building, self-assessment and action planning are time-consuming processes, hence, the community had to be present at the venue for around 3-4 hours. If multiple steps are conducted in a single day due to paucity of time or other reasons, it could potentially hamper optimal outcomes. The SALT facilitators who started the intervention early got time to complete the dream building, self-assessment and action plan exercises on separate dates. But facilitators who joined the intervention late [UG_FL03– Udalguri and KM_FL03 – Kamrup (R)], had less time to complete the intervention and had to carry out the dream building, self-assessment and action plan exercises on the same day in a few villages. (29/01/2018, *Chilabandha village, Udalguri, SALT Facilitator: UG_FL03, VHAA*)
- **Other issues relative to immunization:** In many facilitation sessions, particularly in Kamrup rural, it was observed that concerns other than immunization were highlighted through the SALT process.

Related to trainers

- **Simple and easy sessions are crucial:** After initial difficulties (especially around language) lead facilitators were able to adapt and explain in a suitable manner to the field team. Facilitators also said that their understanding of the SALT approach has increased after the 2nd learning event. The Constellation team members used pictures/ drawings to explain key concepts of the SALT approach and this was helpful.
- **Bringing together the community through humor and games:** During the dream building exercise held at a village, Bongaigaon district, Marlou (from Constellation) requested the community to teach her a game so that she could play that game back in her country. The community obliged her by playing the “Cow and Tiger” game. In this game, one person plays the part of a cow and another becomes the tiger. Other villagers try to protect the cow by forming a circle around the cow. The tiger tries to get hold of the cow by breaking the circle. Once the tiger is successful in entering the circle, the people who form the circle by holding hands, release the cow from inside the circle and do not allow the tiger to get out of the circle, thereby protecting the cow. This game went a long way in helping the team mix well with the community.

Related to facilitators

- **Motivation of the facilitators:** For implementing an unusual intervention like SALT one requires to internalize the approach before implementing. The facilitators were required to unlearn their earlier community engagement experience which mostly evolved around imparting knowledge and awareness among the community members as SALT demanded the skills of listening and appreciating. It was initially observed that the facilitators had difficulties in communicating and facilitating during the first learning event but we observed improvement and better motivation during the second learning event. Some of the common motivating factors that the facilitators shared were – facilitating community to find links that opens up solutions, mutual hope, trust and reciprocity.
- **Focus on introduction as “human beings”:** In the SALT approach, facilitators were encouraged to introduce themselves as “human beings” rather than belonging to any organization/office/institution so that the community can identify with them better. This potentially helped the community members to open up to the facilitators and share their dreams, hopes and concerns.
- **Using SALT in their own lives:** Some of the facilitators shared that they ‘have started using SALT approach in their lives due to which there is a positive change’ in themselves.
- **Good coordination among field team members:** Good team coordination was observed among the field teams during the dream building and self-assessment exercise. The leads of the NGOs understood the process well and were actively participating throughout the process.
- **Preparedness of SALT facilitators:** The facilitators were generally found to be well prepared while going to the field. Most of them carried copies of the home visit, dream building, self-assessment, action plan charts with them while going to the village. However, in some instances the facilitators were not fully prepared. During one of the

follow-ups of action plan exercise in one of the villages, it was observed that the SALT facilitator did not carry any of the charts related to dream building, self-assessment or action plan. The activity had to be cancelled due to some *Puja* in the village. But the SALT Facilitator should ideally have had a copy of the charts for better follow-up on the actions, since the names and phone numbers of the persons responsible for the actions are mentioned in the action plan chart. (31/01/2018, *Ischadagharia village, Kamrup (R)*, SALT Facilitator: KM_FL03, VHAA)

- **Recap of the CLCP process is important:** Since there are chances of new community members participating in the various steps of the intervention like dream building, self-assessment and action planning, the CLCP process needs to be explained from scratch to the new members. This was not found to have been done during one of the monitoring visits (27/01/2018, *Jalkubari FV village, Kamrup (R)*, SALT Facilitator: KM_FL02, VHAA)

Related to community

- **Trust-based relationship:** A good relationship of trust was developed between the community members and the SALT facilitators and that helped to continue the intervention for more than a year (and even beyond that in some villages).
- **Complex intervention to grasp:** It was observed that due to the novelty of the SALT intervention, some of the communities found it difficult to grasp the whole concept behind it. According to facilitators it took around four to six months for the SALT facilitators to build rapport with the community and make them share their thoughts. In most of the cases, the community was not able to recall terms like “CLCP” or “SALT”. However, when the reference of the dreams about their children and village came up and charts were being drawn for the various activities under the SALT intervention, they could recall the same. As per their understanding, ‘this is a process where the community comes together to work for their betterment’.
- **Taking initiatives and ownership:** During follow-up in one of the villages, it was observed that even though the community did not take any actions till that time, but the mothers have started calling the ASHA to ask about the due dates of immunization for their children. (01/02/2018, *Mazgaon village, Kamrup (R)*, SALT Facilitator: KM_FL01, VHAA)

During one of the monitoring visits, it was found that fathers had started taking ownership of the immunization programme post the SALT intervention. Some of the fathers had themselves brought their children for administering polio during the Polio Immunization Drive. (31/01/2018, *Tarabari village, Udalguri*, SALT Facilitator: UG_FL02, VHAA)

- **More time for relationship building:** from observations during M&E in a village in Bongaigaon during one of the activities of revisiting households post follow-up (this is one of the activities which was seen in Bongaigaon district only), a kind of appreciative inquiry could be seen developing in the community. This was likely due to the repeated visits of the SALT facilitator and the corresponding SALT exercises. The champions were found to be very active and supportive.

The community seemed to hold the facilitators in high esteem. Each of the champions wanted the team to have tea and snacks in their individual houses, although the team could not oblige each one of them. (08/02/2018, Kanara Beel village, Bongaigaon, SALT Facilitator: BN_FL02, C-NES)

- **Expectation from SALT facilitators:** It was observed that the community often expects more from the SALT facilitators than just enabling linkage to various departments, experts/ programme personnel as envisaged in SALT/CLCP. In Bongaigaon the community had requested the facilitation team to carry out awareness programme on immunization and other health issues. In one follow-up visit, the community asked the facilitators to explain in detail the immunization schedule. Even though the ANM and Community Health Officer were present at the discussion, they did not come forward to explain the immunization schedule to the community. One of the ANMs said she was new and had limited knowledge about immunization. Eventually, the SALT facilitator had to explain the immunization schedule to the community. (06/02/2018, Bashbari No.4 village, Bongaigaon, SALT Facilitator: BN_FL01, C-NES)

In Udalguri, the ASHA requested the facilitators to talk to health officials regarding issues in the community.

- **Lack of awareness continued to be the case:** During one of the monitoring visits it was observed that even though the community took their children for immunization, they were not aware of the immunization schedule, the diseases prevented through immunization or the details given in the MCP (Mother and Child Protection) card. Post the implementation of the SALT intervention, facilitators said there was improvement in understanding the details like knowing the immunization schedule and names of the vaccine preventable diseases. (09/02/2018, Majgaon Pt II, Bongaigaon, SALT Facilitator: BN_FL01, C-NES)

7 Analytical approach to the evaluation questions – methods

7.1 Primary hypothesis

Our primary hypothesis was that full immunization coverage (FIC) in 12-23 months old children and three doses of DPT or Pentavalent coverage (DPT3) in 6-23 months old children would be higher in intervention group compared to the control group. Moreover, any improvement in vaccination coverage can be attributed to the SALT intervention. The two primary outcome variables viz., full immunization and DPT3 status of children (both binary) are defined in section 2.1.

In this report we did not attempt to differentiate between DPT and Pentavalent vaccine. Even though Pentavalent vaccine was launched in study districts long before the endline survey, the old vaccination cards are still used and was available with the study population. There was a lot of confusion in the vaccination card entries and in the understanding of the mother about the specific vaccine administered to the child (DPT or Pentavalent). DPT status is defined if the child received either DPT or Pentavalent. Completion of vaccine schedule for vaccines that require multiple doses (e.g., OPV/Pentavalent) remains a major challenge

towards achieving the optimal level of FIC. Hence, DPT3 coverage is an important indicator in the context of childhood immunization.

7.2 Statistical analyses

We conducted the analysis of individuals as they were randomized (intention to treat- ITT analysis). Since we expect the outcomes to be correlated within villages, we account for the clustering at the village level. We analyse the effect of the intervention by comparing outcomes at endline between the intervention and control arms, after adjusting village-level log odds of coverage at baseline. We use a random effects logistic regression model to analyse the binary outcome variables clustered at the village level. Specifically, the model is

$$\text{logit}(\pi_{ijk1}) = \alpha + \beta G_k + \gamma C_{jk0} + \mathbf{x}'_{ijkt} \mathbf{B} + \mathbf{z}'_{jkt} \boldsymbol{\gamma} + u_{jk}$$

$$u_{jk} \sim N(0, \sigma_u^2)$$

Let $y_{ijkt} \sim \text{Bin}(\pi_{ijkt}, 1)$ denote the binary response for the i^{th} child in the j^{th} cluster (village) in the k^{th} treatment arm ($k=0$ for control, $k=1$ for intervention) at time t ($t=0$ for baseline, $t=1$ endline), where π_{ijkt} denotes the probability of the child being either fully immunized or having received three doses of DPT or Pentavalent. In the regression model, let G_k denote the treatment arm (control=0 and intervention=1) and C_{jk0} denote the baseline log-odds of the response for the j^{th} cluster in the k^{th} treatment arm, $C_{jk0} = \log \frac{\bar{Y}_{.jk0}}{1-\bar{Y}_{.jk0}}$, $\bar{Y}_{.jk0} = \frac{\sum_{i=1}^{n_{jk0}} Y_{ijk0}}{n_{jk0}}$. Let \mathbf{x}'_{ijkt} and \mathbf{z}'_{jkt} denote the individual- and village-level characteristics, respectively. Finally, let u_{jk} denote the village-level random effects that are independently and identically distributed as normal variables with mean 0 and variance σ_u^2 . The intervention effect is the exponential of the treatment arm coefficient (β). The primary quantitative equation as mentioned above was discussed in the pre-analysis plan (0).

Several researchers (Vickers and Altman, 2001, Ukoumunne and Thompson, 2001, Lewsey, 2004, Austin, 2007, Austin, 2010) compared the relative power of different statistical methods for the analysis of cluster randomization trials with binary outcomes. In the context of analysis of repeated cross-sectional cRCTs with binary outcomes, using Monte Carlo simulation techniques, Austin (2010) found that the use of random effects models to estimate the effect of the intervention on the change in the follow-up response from the baseline response consistently had lower statistical power compared to the other competing methods across a wide range of scenarios. In other words, modelling only the endline binary response adjusted for the baseline response (analysis method used for the study) tended to have greater power than that of difference-in-difference (actually, ratio-of-odds ratios for binary outcomes) method where the intervention effect is the interaction term between treatment arm and time.

We run a sequence of models. Initially, in the unadjusted analysis, we control for the treatment assignment and the baseline log odds of the outcome. In the subsequent adjusted analysis, we control for key sociodemographic and economic characteristics at the individual- and village-level. The individual-level variables considered are child's gender, birth order, mother's age during survey, her education, father's education, household head's caste, religion, and household wealth quintile. The village-level variables included in the

adjusted analyses are percentage of mothers who cannot read and/or write, percentage households in the poorest wealth quintile, and average time to vaccination site.

We used district, gender and birth order of child to predefine subgroup analyses. In addition, we explored if there is treatment heterogeneity by village baseline coverage. For each subgroup, we repeated the analysis with the addition of the subgroup variable along with its interaction with treatment, while adjusting for key background characteristics. Heterogeneity was assessed based on the significance of the interaction term.

We conduct a range of a sensitivity analyses to examine the effect, if any, of dropping the villages from the intervention and control arms after randomization. We compared the baseline characteristics of the dropped villages with the villages that were retained in the trial. We also compared the characteristics of the dropped villages with the control villages at endline. Lastly, we combined the dropped villages with the control villages and examined the effect of the intervention for the two primary immunization outcomes by comparing the intervention villages with the combined group of dropped and control villages. As per requests from the reviewer, we also applied difference-in-difference (actually, ratio-of-odds ratios for binary outcomes) method using data from baseline and endline to estimate the intervention effect which is defined as the interaction term between treatment arm and time.

7.3 Qualitative data analysis

Qualitative data analysis started with the first set of interviews. Each FGD and interview was followed by writing short summaries to capture the key issues that emerged from the interviews. Memos were written down and discussed within team on daily basis and during debriefing sessions conducted with Principal Investigator.

Nvivo version 11 Pro was used to support analysis, especially for coding and categorizing data.

Thematic analysis approach was used; *a priori* coding framework was prepared based on the topic guides that were used in the data collection process for the each of the three methods viz. FGDs, KIIs and IDIs. The framework was applied to a set of five interviews to check for emerging codes, which were then added to the framework. *A priori* code list was developed to help in segregating the data under various themes. The codes were extracted to get a preliminary understanding of the data. The extracts were manually analysed to group comments related to specific categories for commonalities and contrasts, and to further develop overarching themes. The preliminary findings obtained out of the data were further discussed within the team to improve the analysis.

A final NVIVO file was prepared thereafter where the final codes were entered and a codebook for the final Qualitative Data Analysis was also generated to check for discrepancies. A team of three researchers did coding all interview transcripts and various output files of the coded transcripts were retrieved to analyse various themes.

8 Results – Quantitative data analysis

8.1 Trial profile

First we present the profile of the randomized evaluation study along with sample size and data exclusions at various steps of sampling and randomization (Figure 5). Post randomization, after minimizing the chance of intervention-control contamination, we were left with 64 (32 intervention + 32 control), 66 (33+33), 66 (32+34) villages in Bongaigaon, Kamrup rural and Udalguri district, respectively. The intervention agency was given the liberty to drop two intervention villages as our sample size requirement was 30 intervention villages per district. This was considered keeping in mind the perceived implementation related challenges such as difficult terrain, difficulty in reaching the village due to transportation issues. However, for intention-to-treat (ITT) analysis, we considered 97 intervention villages and 99 control villages.

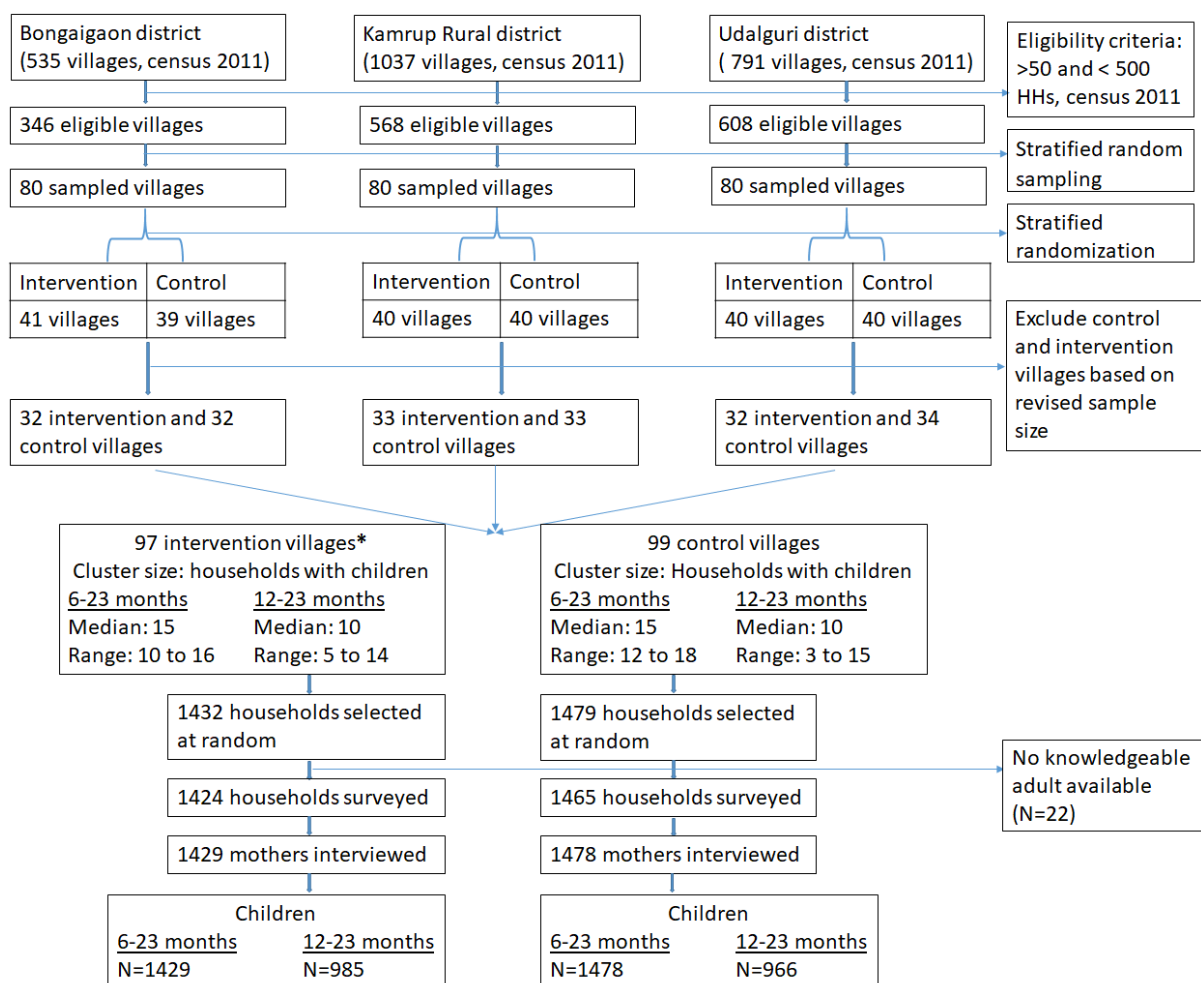


Figure 5: Trial profile of the randomized evaluation of SALT intervention in rural Assam

*Note: Although our sample size requirement was 90 villages in each treatment arm, for intention-to-treat (ITT) analysis, we considered 97 intervention villages and 99 control villages.

8.2 Background characteristics of participants

In Table 6 we present the socio-demographic and economic characteristics of study participants based on endline data at the individual and household level as well as at the village level where the study participant lived at the time of the survey. As per our analytic dataset, a total of 2907 mothers with 6-23 months old children at the time of endline survey were interviewed: 1429 in the intervention villages and 1478 in the control villages.

Mothers in the intervention and control arms have similar characteristics – age at survey, education, age at marriage, receipt of full antenatal care during pregnancy, spouse’s education. Small differences exist – there are more mothers with no schooling or some primary education in the intervention arm as compared to the control arm (33% vs. 27%). The 6-23 months old children in the two arms are very similar with respect to their background characteristics – gender, birth order, born in a health facility and have a vaccination card. Households are also similar across the two arms.

The villages in the intervention arm, on average, have a higher proportion of households in the poorest wealth quintile (median = 20% in intervention villages vs. median = 13% in control villages), as compared to the control villages. The intervention villages also have a higher proportion of mothers who cannot read and/or write (median = 12% in intervention villages vs. median = 7% in control villages), and a higher proportion of households with the head of household belonging to a scheduled tribe (median = 20% in intervention villages vs. median = 13% in control villages) as compared to the control villages.

Even though small differences exist at the cluster (village) and individual levels, overall the participants in the two arms are quite similar as evident in figures provided in Table 6.

Table 6: Background characteristics of 6-23 months old children in the endline survey by intervention and control arm

Characteristics	Intervention (N=1429)	Control (N=1478)	Total (N=2907)
Child			
District			
Bongaigaon	466 (33%)	475 (32%)	941 (32%)
Kamrup Rural	479 (34%)	485 (33%)	964 (33%)
Udalguri	484 (34%)	518 (35%)	1002 (34%)
Sex			
Boy	730 (51%)	744 (50%)	1474 (51%)
Girl	699 (49%)	734 (50%)	1433 (49%)
Age in months			
6-11	444 (31%)	512 (35%)	956 (33%)
12-23	985 (69%)	966 (65%)	1951 (67%)

Birth order			
First	778 (55%)	823 (56%)	1601 (55%)
Second	460 (32%)	473 (32%)	933 (32%)
Third or more	186 (13%)	180 (12%)	366 (13%)
Missing	5 (0%)	2 (0%)	7 (0%)
Born in a health facility			
No	134 (9%)	126 (9%)	260 (9%)
Yes	1290 (91%)	1350 (91%)	2640 (91%)
Missing	5 (0%)	2 (0%)	7 (0%)
Has vaccination card			
No	51 (4%)	54 (4%)	105 (4%)
Yes	1378 (96%)	1424 (96%)	2802 (96%)
Mother			
Age in years			
Less than 20	97 (7%)	76 (5%)	173 (6%)
20-24	563 (39%)	605 (41%)	1168 (40%)
25-34	693 (48%)	732 (50%)	1425 (49%)
35-plus	76 (5%)	65 (4%)	141 (5%)
Age at marriage			
Less than 18	410 (29%)	377 (26%)	787 (27%)
18-24	870 (61%)	964 (65%)	1834 (63%)
25 or more	149 (10%)	137 (9%)	286 (10%)
Education			
No schooling	146 (10%)	121 (8%)	267 (9%)
Some primary	324 (23%)	279 (19%)	603 (21%)
Some secondary	742 (52%)	821 (56%)	1563 (54%)
More than secondary	217 (15%)	257 (17%)	474 (16%)
Received full ANC during pregnancy			
No	780 (55%)	838 (57%)	1618 (56%)
Yes	644 (45%)	638 (43%)	1282 (44%)

Missing	5 (0%)	2 (0%)	7 (0%)
Spouse's education			
No schooling	160 (11%)	118 (8%)	278 (10%)
Some primary	342 (24%)	352 (24%)	694 (24%)
Some secondary	677 (47%)	730 (49%)	1407 (48%)
More than secondary	250 (17%)	278 (19%)	528 (18%)

Household

Household head's caste

Scheduled caste	109 (8%)	82 (6%)	191 (7%)
Scheduled tribe	309 (22%)	385 (26%)	694 (24%)
Other backward class	369 (26%)	422 (29%)	791 (27%)
General/Don't know	642 (45%)	589 (40%)	1231 (42%)

Household head's religion

Hindu	931 (65%)	981 (66%)	1912 (66%)
Muslim	425 (30%)	417 (28%)	842 (29%)
Other	73 (5%)	80 (5%)	153 (5%)

Household wealth quintile

Poorest	296 (21%)	280 (19%)	576 (20%)
Poorer	279 (20%)	301 (20%)	580 (20%)
Middle	289 (20%)	291 (20%)	580 (20%)
Richer	288 (20%)	294 (20%)	582 (20%)
Richest	277 (19%)	312 (21%)	589 (20%)

Village (cluster)

<i>N</i> ^a	99	97	196
Percentage of households in poorest wealth quintile ^a , Median (IQR)	20% (27%)	13% (20%)	13% (20%)
Percentage of mothers who cannot read and/or write ^a , Median (IQR)	12% (25%)	7% (20%)	7% (20%)
Percentage of households with Muslim head of household ^a , Median (IQR)	0% (60%)	0% (70%)	0% (64%)

Percentage of households with the head of household belonging to a scheduled tribe ^a , Median (IQR)	6% (33%)	0% (54%)	0% (64%)
Average time to vaccination site (in minutes) ^a , Median (IQR)	18 (9)	19 (9)	18 (9)

Note: Data are *N* (%) unless indicated otherwise. *N* indicates number of children expect for variables measured at the village level (as indicated by ^a).

8.3 Results of primary and secondary outcomes and sub-group analysis

Table 7 and Table 8 present the findings from the main analysis for the primary and secondary outcomes, respectively. The unadjusted model includes only two explanatory variables; the treatment assignment indicator and the baseline village-level log-odds of the outcome. Explanatory variables in the adjusted model include, in addition to the variables in the unadjusted analysis, district, gender and birth order of the child, mother’s age, education, spouse’s education, household head’s religion and caste, household wealth quintile, and village-level variables –proportion of households in the poorest wealth quintile, proportion of mothers who cannot read and/or write, and average travel time to vaccination site.

The adjusted analysis shows that the intervention has had no effect on full immunization in 12-23 months old children as the odds ratio is close to 1 (OR= 0.97, 95% CI (0.70,1.34)). Also, the odds of receiving all three doses of DPT among 6-23s month old children is similar across the intervention and control arms. The results for the adjusted and unadjusted analyses are very similar. The analyses suggest that the intervention did not have any effect on the secondary outcomes either (Table 8). Similarly, for the WASH outcomes, the intervention did not have any effect (Table 9).

Table 10 presents the findings of the subgroup analyses for the two primary immunization outcomes. None of the subgroups based on various factors - district, gender of the child, birth order of the child and village baseline full immunization coverage, show a significant effect of the intervention on either of the primary outcomes. However, some of the results were promising, but they were not statistically significant. For example, in villages that had a low full immunization coverage at baseline, children in the intervention arm were 1.4 times more likely to receive all three doses of DPT than children in the control arm. However, this finding was not statistically significant.

Table 7: Analysis of primary evaluation outcomes based on endline survey data

Outcome	Intervention N (%)	Control N (%)	Total N (%)	Unadjusted ^a			Adjusted ^b		
				N	Odds ratio (95% CI)	P value	N ^y	Odds ratio (95% CI)	P value
Full immunization (12-23 month old child)									
Baseline									
No	211 (24%)	214 (24%)	425 (24%)						
Yes	660 (75%)	679 (76%)	1339 (75%)						
Missing	8 (1%)	3 (0%)	11 (1%)						
Endline									
No	230 (23%)	223 (23%)	453 (23%)	1948	0.98	0.89	1943	0.97	0.85
Yes	753 (76%)	742 (77%)	1495 (77%)		(0.70, 1.36)			(0.70, 1.34)	
Missing	2 (0%)	1 (0%)	3 (0%)						
Three doses of DPT (6-23 month old child)									
Baseline									
No	267 (18%)	265 (18%)	532 (18%)						
Yes	1174 (81%)	1210 (82%)	2384 (81%)						
Missing	6 (0%)	7 (0%)	13 (0%)						
Endline									
No	253 (18%)	258 (17%)	511 (18%)	2902	0.99	0.95	2895	1.01	0.96
Yes	1173 (82%)	1218 (82%)	2391 (82%)		(0.73, 1.35)			(0.75, 1.36)	
Missing	3 (0%)	2 (0%)	5 (0%)						

Note: ^a Explanatory variables in the unadjusted model include the treatment assignment and the baseline village-level log-odds of the outcome.

Note: ^b Explanatory variables in the adjusted model include, in addition to the variables in the unadjusted analysis, district, gender and birth order of the child, mother's age, education, spouse's education, household head's religion and caste, household wealth quintile, and village-level variables –proportion of households in the poorest wealth quintile, proportion of mothers who cannot read and/or write, and average travel time to vaccination site.

Note: ^y Because of missing adjustment variables data, the observations used in adjusted analysis are fewer than those used in unadjusted analysis.

Table 8: Analysis of secondary outcomes based on endline survey data

Outcome	Intervention N (%)	Control N (%)	Total N (%)	Unadjusted ^a			Adjusted ^b		
				N	Odds ratio (95% CI)	P value	N ^y	Odds ratio (95% CI)	P value
Dropout between DPT doses 1 and 3									
Baseline									
No	1174 (83%)	1210 (83%)	2384 (83%)						
Yes	247 (17%)	241 (17%)	488 (17%)						
Endline									
No	1173 (84%)	1218 (83%)	2391 (83%)	2869	0.97	0.85	2863	0.97	0.82
Yes	230 (16%)	248 (17%)	478 (17%)		(0.71, 1.33)			(0.72, 1.30)	
Vaccination card available and seen by enumerator									
Baseline									
No	117 (8%)	125 (8%)	279 (8%)						
Yes	1330 (92%)	1357 (92%)	3307 (92%)						
Endline									
No	225 (16%)	198 (13%)	423 (15%)	2907	0.83	0.18	2900	0.76	0.05
Yes	1204 (84%)	1280 (87%)	2484 (85%)		(0.62, 1.10)			(0.57, 1.01)	
Timely measles vaccination^z									
Baseline									
No	175 (22%)	149 (19%)	324 (21%)						
Yes	618 (78%)	625 (81%)	1243 (79%)						
Endline									
No	134 (17%)	126 (16%)	260 (16%)	1581	0.83	0.32	1578	0.99	0.94
Yes	653 (83%)	668 (84%)	1321 (84%)		(0.58, 1.20)			(0.68, 1.43)	
Mother has seen/heard/read any immunization messages in the last 6 months									
Baseline									
No	727 (50%)	690 (47%)	1417 (48%)						
Yes	720 (50%)	792 (53%)	1512 (52%)						
Endline									
No	517 (36%)	468 (32%)	985 (34%)	2907	0.75	0.13	2900	0.73	0.12
Yes	912 (64%)	1010 (68%)	1922 (66%)		(0.51, 1.10)			(0.48, 1.15)	

Mother believes that community has a role to play in improving the health of her child and that community is capable of taking actions to prevent her child from getting sick

Baseline

No	528 (36%)	449 (30%)	977 (33%)
Yes	919 (64%)	1033 (70%)	1952 (67%)

Endline

No	299 (21%)	232(16%)	531 (18%)	2907	0.68	0.07	2900	0.73	0.06
Yes	1130 (79%)	1246 (84%)	2376 (82%)		(0.45, 1.04)			(0.48, 1.01)	

Household attends village meetings and engages in community actions to tackle village issues

Baseline

No	723 (50%)	606 (41%)	1329 (45%)
Yes	724 (50%)	876 (59%)	1600 (55%)

Endline

No	459 (32%)	423 (29%)	882 (30%)	2907	0.75	0.06	2900	0.75	0.05
Yes	970 (68%)	1055 (71%)	2025 (70%)		(0.55, 1.01)			(0.55, 1.01)	

Note: ^a Explanatory variables in the unadjusted model include the treatment assignment and the baseline village-level log-odds of the outcome.

Note: ^β Explanatory variables in the adjusted model include, in addition to the variables in the unadjusted analysis, district, gender and birth order of the child, mother's age, education, age at marriage, spouse's education, household head's religion and caste, household wealth quintile, and village-level variables –proportion of households in the poorest wealth quintile, proportion of mothers who cannot read and/or write, proportion of households with a Muslim head of household, proportion of households where head of household belongs to a scheduled tribe and average travel time to vaccination site.

Note: ^γ Because of missing adjustment variables data, the observations used in adjusted analysis are fewer than those used in unadjusted analysis.

Note: ^ε Assessed in children 12-23 months old who had a vaccination card.

Table 9: Analysis of WASH outcomes based on endline survey data

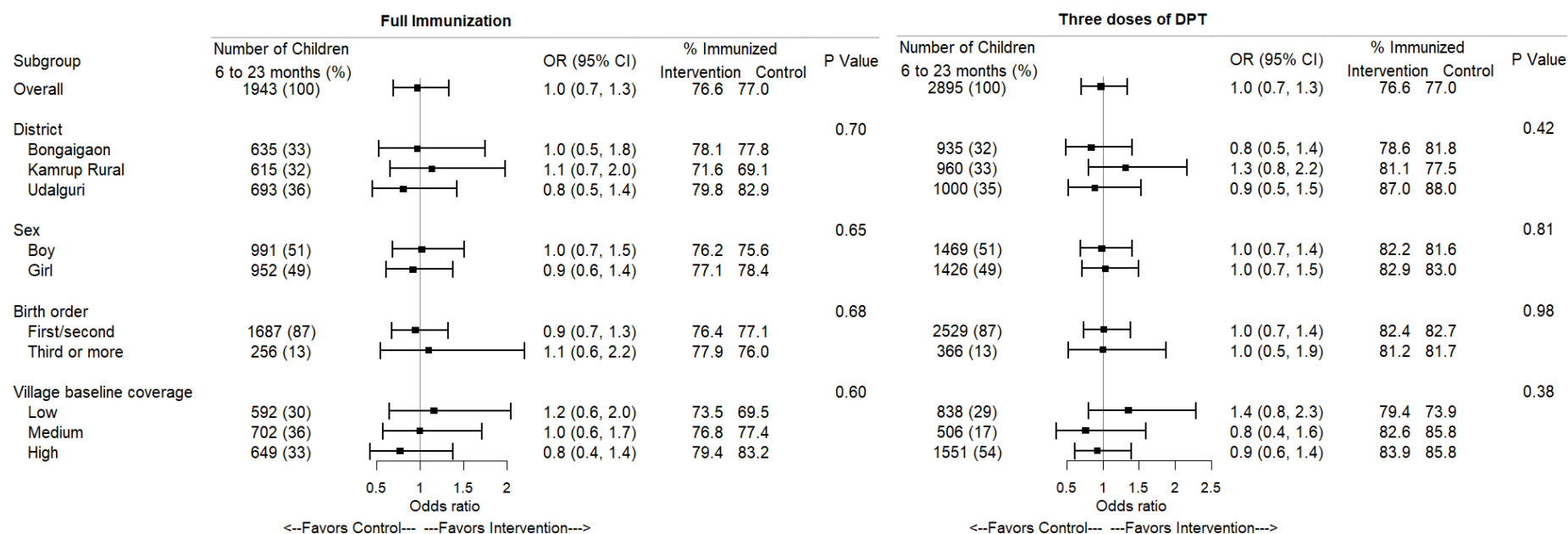
Outcome	Intervention N (%)	Control N (%)	Total N (%)	Adjusted ^β		
				N ^γ	Odds ratio (95% CI)	P value
Safe drinking water						
Baseline						
No	788 (54%)	851 (57%)	1639 (56%)			
Yes	659 (46%)	631 (43%)	1290 (44%)			
Endline						
No	900 (63 %)	839 (57 %)	1739 (60 %)	2900	0.71	0.06
Yes	529 (37 %)	639 (43 %)	1168 (40 %)		(0.50, 1.02)	
Household has latrine						
Baseline						
No	200 (14%)	251 (17%)	451 (15%)			
Yes	1247 (86%)	1231 (83%)	2478 (85%)			
Endline						
No	189 (13%)	118 (8%)	307 (11%)	2900	0.45	<0.01
Yes	1240 (87%)	1360 (92%)	2600 (89%)		(0.29, 0.70)	
Good handwashing practices						
Baseline						
No	276 (19%)	322 (22%)	598 (20%)			
Yes	1171 (81%)	1160 (78%)	2331 (80%)			
Endline						
No	293 (21%)	270 (18%)	563 (19%)	2900	0.90	0.52
Yes	1136 (79%)	1208 (82%)	2344 (81%)		(0.65, 1.24)	

Note: ^α Explanatory variables in the unadjusted model include the treatment assignment and the baseline village-level log-odds of the outcome.

Note: ^β Explanatory variables in the adjusted model include, in addition to the variables in the unadjusted analysis, district, gender and birth order of the child, mother's age, education, age at marriage, spouse's education, household head's religion and caste, household wealth quintile, and village-level variables –proportion of households in the poorest wealth quintile, proportion of mothers who cannot read and/or write, proportion of households with a Muslim head of household, proportion of households where head of household belongs to a scheduled tribe and average travel time to vaccination site.

Note: ^γ Because of missing adjustment variables data, the observations used in adjusted analysis are fewer than those used in unadjusted analysis.

Table 10: Subgroup analyses for the primary immunization outcomes based on endline survey data



8.4 The possible role of Mission Indradhanush on immunization coverage

One event that took place and that could have had a major effect on the findings is Mission Indradhanush (MI), a flagship program of the Ministry of Health and Family Welfare (MoHFW) for improving immunization coverage. All three study districts received MI phase 2 (Nov 2015-Feb 2016) before the baseline survey.

Table 11: Comparison of three doses DPT coverage in NFHS-4 and SALT surveys

District	NFHS-4 (rural)* Data collection period: Nov 2015 – Mar 2016	SALT baseline (6-23 month old children)** June – Aug 2016	SALT endline (6-23 month old children)** July – Sep 2018
Bongaigaon	69.1	78.8 (1180)	80.8 (1181)
Kamrup rural	54.8	85.3 (1201)	80.4 (1154)
Udalguri	80.5	88.2 (1203)	88.2 (1212)

*Note: Sample includes 12-23 months old children. Sample size is not readily available from NFHS-4 district fact sheets. Coverage estimates are survey-weighted

**Note: The parenthesis includes sample size. The district-level estimates are unweighted estimates.

In Table 11, we compare three doses of DPT coverage across NFHS-4 and two rounds of surveys pre and post SALT intervention. Although the estimates are not strictly comparable, it is evident that the coverage has improved significantly between NFHS-4 and SALT baseline and continued to be at the high level during SALT endline. This sudden increase in vaccination coverage can perhaps be attributed to Mission Indradhanush (MI). NFHS-4 data collection period in Assam coincides with the MI phase 2, hence, the impact on coverage may not be seen during NFHS-4. The third phase of MI (Apr-July 2016) includes only Bongaigaon district, among the three study districts. In selected blocks of all three study districts, the fourth phase of MI (Feb-May 2017) was also implemented. None of our study districts were part of the intensified Mission Indradhanush (IMI) which was implemented during Oct 2017 to January 2018.

Note that the estimates in Table 11 from NFHS-4 and SALT surveys are not strictly comparable because of several reasons: exclusion criteria (considering only villages having total number of households between 50 and 500) used in our study, the way the vaccination coverage is defined and source of data used (combination of vaccination card and mother's recall), not using survey weights, difference in data quality, among others. However, methods used to define the estimates from SALT surveys do not compromise the internal validity of the evaluation study.

8.5 Summary findings from process evaluation

District-wise summary of village-level process indicators are presented in the appendix (Appendix C). During the 13-month intervention period (March 2017- March 2018), all steps of the intervention were completed in 88 of the 90 villages where implementation happened. The median number of visits to a village made by SALT facilitators during the intervention period varied from 14 in Kamrup Rural to 20 in Udalguri. The protocol suggested that the facilitators visit each village twice a month implying a requirement of a total of about 25 visits per village. During home visits, the facilitators were able to reach out to 19% (median, IQR =

16% to 25%) of households in the village. The intervention resulted in an average of 8 (median, IQR = 6 to 12) community meetings (including meetings with specific groups). During the intervention period, the dream-building activity took place at 7 months, leaving 6 months for the remaining activities – self-assessment, action planning and action phase. These activities are meant to be iterative – the number of villages in which self-assessment was repeated at least once varied between 23 (more than two-thirds) in Bongaigaon to 14 (less than half) in Udalguri.

9 Results – Qualitative data analysis

The results for this report are drawn from all FGDs, KIIs and In-depth Interviews (IDIs) representing different groups of respondents across the three study districts. The qualitative findings on community perceptions on child health, the community’s and frontline worker’s perceptions and experiences on immunisation including the latter’s challenges and constrains in implementation of immunisation services are shared in Appendix D. Here we present only the opinions and experiences pertaining to the SALT intervention.

9.1 SALT intervention - opinions and experiences

This section outlines people’s opinions about SALT and provides insights into the SALT approach’ potential contribution to immunisation. For FGDs generally open invitations to mothers, grandmothers and fathers respectively were made through the ASHA. Not all had heard of or were aware of the elements on the SALT/CLCP process. A summary of awareness among those attending FGDs is as follows:

Table 12: Analytical summary on awareness of SALT/CLCP as noted during FGDs

DISTRICTS	Total FGDs conducted	FGDs where none had heard about SALT	VILLAGES where none had heard about SALT	FGDs where everyone present had heard about SALT	FGDs where at least some had heard about SALT
Bongaigaon	15	4	4 (2 control)	5	6
Udalgudi	11	3	3 (2 control)	6	2
Kamrup(R)	13	9	8 (2 control)	1	3
TOTAL	39	16	15 (6 control)	12	11

From Table 12 it is evident that there were a considerable number (15/28) of villages in which none of the FGD participants could recall any aspect of the SALT/CLCP intervention despite probing about specifics. Excluding control villages this would still remain 9 of 22 or 41% of villages sampled for qualitative work.

9.1.1 Did the SALT intervention bring about changes in immunization?

Those individuals and groups who had participated in the SALT process in some way, tended to agree that the SALT intervention was useful to them. In an FGD with fathers in Bongaigaon district the respondents claimed that post SALT intervention their knowledge regarding vaccines has increased where earlier even if they were curious to know why vaccines were given, the health workers failed to address their queries, but right after the SALT intervention the awareness amongst the people had increased. People now reported being aware of the benefits and or importance of immunization. it was said that they have

started taking their child for vaccination without prodding from the health workers. Earlier people didn't welcome the idea of vaccination although health workers repeatedly spoke to them about the importance of vaccination.

“Now, the people have started giving importance to vaccination schedules, and even before the ASHA informs, people come forward enquiring about matters relating to child's health or immunization”.

In a few villages viz. Tinkonia Pt. II (Bongaigaon), Nayapara Pt. I (Bongaigaon), Uttar Bordol (Kamrup) positive response were recorded regarding the SALT intervention where the people could recollect about the meetings organized and process discussed, but often there was poor recollection of the details of the SALT process.

A few respondents said that they had discussions related to their confusions regarding vaccination at the SHG groups. One respondent mentioned that the progress in immunization had happened due to ASHA's effort in carrying forward the vaccination procedure (FGD with mothers in Kamrup Rural district). A similar response was recorded in a control village in Kamrup (R) where the ASHA spoke about arranging meetings and discussions amongst people to spread awareness on the importance of immunization.

In the baseline qualitative data it was found that mothers and mothers-in-law had lower levels of awareness regarding the importance of immunization. Whereas in the end line data set it appeared that mothers and mothers-in-law) were generally more aware about the importance of immunization.

Improved changes in the coverage level of immunization after SALT intervention were mentioned as observed in FGDs with mothers, fathers and grandmothers across the three study districts. The KIIs in Bongaigaon and Udalguri districts also indicated changes with regards to immunization. In the FGDs and the KIIs the respondents mentioned that there has been reduction in fear regarding side effects following vaccination, thereby leading to increase in acceptance of vaccination. The awareness amongst the mothers has increased regarding immunization dates where several of them also mentioned going through the MCP cards. There were a few instances where people recalled the things discussed during the process but did not remember any specific terms such as SALT.

The DPO of Bongaigaon district talked about role reversal where he claimed that earlier people were not serious about the immunization cards nor did have much knowledge about vaccination. But now people have realized the importance of the immunization card and realized their responsibility regarding this card. Now even a SALT Champion or a villager can explain the immunization schedule clearly and they know which vaccine is due when. Even sometimes, it happens that if an ASHA worker or the ANM does not come, then people call them and remind them about the vaccine schedule. “This role reversal is a real big achievement.” (*IDI DPO CNES-01, Bongaigaon*)

In one of the KIIs the respondent asserted that when ASHA or ANM does not come to inform people about the immunization dates, the community people remind others about the vaccination dates. The KI considers this role reversal to be an achievement of SALT intervention.

9.1.2 Was the SALT process useful?

Through dream building process of SALT, community members in one of the village decided to put up signboards displaying the usefulness of vaccination. It was said that after SALT intervention, many people initiated the practice of reading the MCP cards. Few people mentioned that although some people did not turn up for any SALT meetings, but transfer of knowledge had taken place among them (non- participants) too. In one FGD with Fathers in Bongaigaon district where they mentioned that transfer of knowledge regarding vaccination has taken place between the people who participated in the SALT meetings and the ones who were not able to attend. Due to this knowledge sharing of SALT intervention process the water supply facilities were introduced in some communities which solved their water crisis problem. The community started to identify their own issues and started taking collective community initiatives to tackle them.

Examples of initiatives taken by the community themselves were the generation of funds suggested by a woman from Kadamgudi village of Udalgudi in order to purchase sports equipment for the children and willingness of the mothers in communicating the information regarding immunization which has moderately decreased the ASHA's workload. Some of the youth from Udalguri initiated plantation of trees at the community. In villages like Saikiapara and Simalubari of Udalgudi district, male involvement was reported to have improved whereby the fathers have started taking their children for vaccination as well as attending the VHND.

Respondents not only highlighted the current changes, but also shared their thoughts for long term outcomes. Some people said that apart from increasing their knowledge and benefits of Immunization, if the community came together and used the SALT process; all the social problems and corruption prevailing in their community could be eliminated one day.

Post SALT intervention the community noticed changes in the drinking water practices as people have come to know about the importance of 'pure' drinking water and have started using boiled water. Besides they have also set up tube wells and made domestic filters.

"Earlier illnesses amongst children such as diarrhoea was prominent have decreased a lot due to information sharing." (FGDFathers-03, Bongaigaon)

It was said that, after SALT intervention there has been **elimination of superstitious beliefs** among the people and **promotion of institutional delivery**. The response with regards to elimination of superstitious beliefs came up in an FGD with fathers in Bongaigaon District where the participants mentioned that after SALT intervention the superstitions with regards to institutional delivery have gone down post SALT intervention and now people come forward for institutional delivery:

"People used to have some blind beliefs that giving birth to a child in the hospital might ruin their health condition as in hospitals vaccinations are given to the child so giving home delivery was preferred."(FGD Fathers-03, Bongaigaon)

"After SALT team arrived, lots of improvement occurred here, mainly about hygiene and family planning. They are coming forward regarding family planning too. Before, they gave least importance regarding family planning. But now they are coming forward." (KIB ASHA Worker-04, Bongaigaon)

Promotion of hygiene sanitation and cleanliness - respondents opined that post SALT intervention they have started using latrines and have also taken initiatives to keep the village and its surroundings clean and tidy. In one of the FGDs the respondents collectively made the following comment:

“After SALT process was initiated in our village we have taken initiatives to clean the roads in and around our village. We clear the shrubs and other outgrowths around the roads on a regular basis.”(FDGMothers-01, Udalguri)

In one of the FGDs the respondents reported that post SALT intervention children have got the opportunity to play with proper sports equipment. They felt they were able to find **solutions to community problems** locally through the SALT process. The respondents stated that in their village there was water supply provision initiated by the Public Health Department, but since last two to three years the water supply facility was dysfunctional following which they had to face water crisis in their village. After the initiation of the SALT intervention in their village frequent meetings were held to discuss the issues concerning the community wherein they brought forward the issue of water supply. Based on the discussions in those meetings the community collectively approached the village Panchayat and sought a solution to this water crisis:

“Earlier we did not have water supply facilities here but now after this project of almost 1.5 years the water crisis problem has been solved. With the help of Panchayat this water supply provision has been started.” (FGD Mothers-09, Kamrup Rural)

Respondents also expressed that the SALT intervention has strengthened the **unity and solidarity** among them. This response was seen across FGDs in the three study districts viz. Kamrup (R), Bongaigaon and Udalguri. They claimed that although unity and solidarity existed among them earlier too, the SALT intervention has strengthened it:

“We have developed a sense of unity among ourselves. Although it was there before, the SALT process has strengthened the sense of unity among the people of our village.” (FGDMothers-01, Udalguri)

Box 2: List of other benefits attributed to the SALT intervention

- Addressing social problems
- Information sharing among the community
- Elimination of superstitious beliefs
- Promotion of institutional delivery
- Changes in the community’s perception about family planning
- Promotion of hygiene, sanitation and cleanliness
- Opportunities for games and sports for children
- Solution of community problems
- Strengthening of unity and solidarity among the community

9.1.3 Experience of using MCP Cards

The practice of reading Mother and Child Protection (MCP) cards was one of the areas on which information was sought from the respondents during the qualitative data collection

process. The responses obtained on the practice of reading MCP cards varied across fathers, mothers and grandmothers.

In the Focus Group Discussions (FGDs) conducted with fathers, responses ranged from 'they have read the MCP cards' to 'there are a lot of things written in the MCP card and have read only some of it' to 'cannot recall everything written on the MCP card'. Respondents asserted that the practice of reading MCP cards was a part of the SALT action plan in their village and some people have already adopted the practice of reading the MCP cards.

"Yes we read the MCP to check the date of next vaccine." (FGDMothers-03, Kamrup Rural)

Most of the respondents in the FGDs with Grandmothers were of the opinion that they had not read the MCP card as they 'cannot read and write'. Some respondents said their daughters-in-law knew about the MCP cards. In contrast, the retaining of the MCP cards by ASHAs as hampering their ability to know was also expressed:

"The ASHA keeps the card with her. She informs us about the dates of vaccines. We will be able to read the card only if we get it in our hand. The card is with the ASHA so we do not get a chance to read it." (FGDGrandmother-02, Udalguri)

One of the issues flagged in FGDs with mothers and with grandmothers was that no meetings were held in their village to help them discuss, read and understand the MCP cards.

9.1.4 Dreams regarding our village

Dream building is an important step in the SALT intervention through which people were encouraged to discuss the dreams they cherish about the community. The respondents said that as a part of the dream building exercise in their villages, they undertook discussions on the issues concerning the community at large such as provision for safe drinking water, improvement of child health and overall health status of the village. On immunization, they said as part of the dream building exercise discussions were also undertaken on the importance of vaccines, its benefits and the need to vaccinate children on time.

But in three FGDs Conducted in Kamrup (R) in the villages Uttar Bordol, Hirajani, Khatkhati the participants stated that they had not heard of or participated in any dream building exercise in their village.

9.1.5 Action plans made and plans fulfilled

During FGD participants when asked about the action plans taken, stated that they have initiated awareness meetings and camps regarding immunization and the practice of reading the MCP card. The SALT Action plan reported as mostly been fulfilled was the action plan of attaining full vaccination coverage in the village, where they stated that the vaccination coverage increased and was achieved to the level outlined in the action plans made.

In Kamrup rural district, the respondents also decided to take action to promote provision for purification of water for drinking.

In Udalguri district along with the awareness meetings regarding immunization to reduce drop outs some of the actions reported were organised meetings to ensure that each and every household under the government scheme receives toilet facilities, raising funds for providing playground with necessary sports facilities for their children, raising funds to

construct a club house and made provisions for safe drinking water. They also submitted one application notifying the need for construction of Anganwadi centre in their village, and acted for renovation of their local school and cleanliness drives within their village.

Box 3: List of SALT Action Plans

- Awareness meetings and camps regarding immunization
- Practice of reading MCP cards
- Signboards describing the benefits of SALT
- Plan to recruit more teachers
- Plan to promote purification of water
- Plan to ensure availability of toilet facilities
- Raised funds for providing playgrounds with sports facilities
- Raising funds to construct the club house
- Submitted application for construction of Anganwadi centre
- Plans for renovation of local school
- Plans to promote cleanliness drives
- Planting trees

Another action plan that was discussed as fulfilled was the requirement of a teacher in a school that has in turn increased the number of students attending the school.

9.1.6 Self-assessment (level of grading)

Respondents in FGDs were asked to discuss the grading levels outlined during SALT process, from Level 1 to level 5 (level 1 indicates a low level of competence and level 5 indicates a high level of competence). The central idea behind the self-assessment exercise was that the community assesses themselves, rather than the facilitator assessing them. FGDs conducted with fathers from Bongaigaon district, stated that initially before SALT intervention, they were at level 1 with regards to immunization but now they consider themselves to be at level 3. They felt that they could have achieved level 5 if there was more 'cooperation' from the community. The response regarding lack of cooperation among the community was found only in one FGD with fathers in Bongaigaon, but did not mention any specific reason for the lack of cooperation. Whereas in another FGD conducted with the fathers belonging to a different village stated that prior to SALT intervention, they were at level 3 and now they considered themselves at level 4 and have achieved almost 99% of the immunization coverage. Similarly, in one of the KIIs conducted in Bongaigaon district the ASHA stated that they were initially at level 3 and post SALT they have reached level 4 and that they aspire to reach level 5. Likewise, another ASHA also stated they have reached level 4.

In an FGD with mothers in a village of Kamrup (Rural) district, they were initially unable to recall the levels of grading. But on further probing, they remembered that earlier they were at level 3 and after SALT intervention, they have reached level 4 and now they are aspiring to reach level 5.

In one of the FGDs with grandmothers of Udalguri district they said:

“When SALT intervention started in our village, we were in level 3. We feel that now we have reached level 5.” (FGDGrandmothers-02, Udalguri)

9.1.7 Time and sustainability

The District Program Officer of C-NES NGO was of the opinion that the capacity building and the ownership process of the community in SALT approach “is very good”. He added that one year is not sufficient for SALT, as people now have started seeing the change and are coming forward to be ‘SALT Champions’. “Many more are in the making and a large section is still very inquisitive” But to bring in more understanding people will need one or two more years or may be more than that.

“Obviously, there is hope. I don’t want to claim that we have fulfilled everything. No doubt the SALT Process is a beautiful one but not easy at all. Essentially it is an antithesis of the age old tradition that people at large are accustomed to for so long. For example, to appreciate, to arrange a meeting, get together, to discuss with the community, generally we lack these qualities. Those qualities are being developed to a great extent. Yes, obviously it will sustain, if we can increase the longevity of the SALT process by few more years. It will take some time. Mere one or two years may not be enough. We cannot expect such a good thing within a short span of time. But we are sure that if the same pace continues then obviously the day will not be very far when Salt process will be hundred percent successful.” (IDI DPO CNES-01, Bongaigaon)

10 Discussion

Our study evaluated the impact of a novel community engagement intervention (SALT) in improving immunization uptake. The findings from this evaluation study based on a cluster randomized controlled trial, however, showed no effect of the SALT intervention on children’s immunization coverage in our study population after one year of implementation.

A meta-analysis of the effectiveness of community engagement in public health interventions suggests that there is solid evidence that community engagement approaches have a positive impact on a range of health outcomes including health behaviours (for example, diet, physical activity, smoking habits), health consequences (for example, change in body mass index, reduction in cholesterol) and participant self-efficacy pertaining to the health behaviours (O’Mara-Eves et al., 2015). However, studies evaluating the impact of community engagement interventions in improving immunization coverage are sparse (Habib et al., 2017, Schoeppe et al., 2017, Pandey et al., 2007, Andersson et al., 2009, Owais et al., 2011). Our study addresses this gap in the literature.

To identify the impact of SALT in increasing immunization coverage, we adopted an experimental design which is considered to be the gold standard for evaluation studies. Specifically, we used a cluster randomized controlled trial design. To recruit clusters and participants at baseline, we used a two-stage stratified random sampling method. Within a district, first we stratified clusters (villages) based on census data and randomly selected villages from each of the four stratum. At the second-stage, we selected random sub-sample of eligible HHs (having children in the age group of 6-23 months) from each selected village. Post baseline survey, using baseline data we stratified our sampled clusters again and,

within each stratum, we randomly allocated them to the intervention and control groups. Randomization after baseline allowed us to use an extensive set of sociodemographic and economic characteristics for stratification at the village level, which were not available from census data. Moreover, it provided us with a more accurate estimate of ICC and coverage rates leading to re-estimation of appropriately justified sample size.

Note that the rationale to consider *stratification* for sampling design is different from the rationale to consider *stratification* for randomization. While the former ensures a representative sample of villages from Assam, having varied socio-demographic characteristics, the latter guarantees balance between intervention and control groups with respect to potentially important covariates at baseline. Since control group forms the basis for counterfactual theory of causation, it is important to ensure that intervention and control groups are similar and our methodology ensures it. The study uses a repeated cross-sectional design. Eligible HHs within a cluster were randomly sampled at baseline and HHs will be sampled again at endline following the same method. An appealing feature of repeated cross sectional surveys is that concerns regarding attrition can be avoided (Donner and Klar, 2000). These features of our evaluation design justify the internal validity of our study.

Cluster randomized controlled trial, by design, minimizes the risk of intervention-control contamination as compared to individual-level randomization where sharing of information is more likely to happen if individuals living within the same cluster receive different interventions (Donner and Klar, 2004). However, cluster randomization design does not guarantee that the threat of contamination will be entirely removed. Contamination of control participants may lead to an underestimation of the intervention effect in the context of improving immunization coverage. This may result in rejection of an effective intervention as ineffective because the observed effect size may neither be statistically significant nor programmatically relevant. Our study attempts to minimize intervention-control contamination through introducing distance buffer between intervention and control villages.

As per our revised sample size (90 villages per group), our study was powered to identify a difference of at least eight percentage points in immunization coverage between the intervention and control groups. Any effect size below that may not be detected and risks the intervention being declared as ineffective. With a larger sample size, higher is the chance of detecting a difference, even one that is smaller than the expected difference. We had to tally these methodological considerations against few practical considerations, which also could affect the quality of evidence.

In order to avoid intervention-control contamination, post randomization we discarded some villages from both groups in case intervention and control villages were located in close proximity. It can be argued that this violates the principle of randomization. However, the process of discarding the villages was done in a blinded manner, without considering the logistics of implementation. We assumed that geographical separation of at least 3 KM between intervention and control villages would reduce chances of interaction of community members between groups. Larger distance buffer would have further reduced the chances; however, enforcing a buffer more than 3KM was not feasible since within a district we could discard only 10 villages from each of the two groups. Post evaluation we do not believe that between village 'contamination' was a problem as even within village transfer of information was potentially suboptimal.

To identify the impact of the intervention on childhood immunization, we use a random effects logistic regression model to analyse the binary outcome variables (FIC and DPT3) clustered at the village level. Since we expect the outcomes to be correlated within villages, we account for the clustering at the village level. We compare outcomes at endline between the intervention and control arms, after adjusting village-level log odds of coverage at baseline. Vickers and Altman (2001) recommended adjusting for baseline responses over the use of analyzing change from baseline, as it generally has higher statistical power. The advantage of using adjusted model is its ability to adjust for an imbalance of cluster or subject level characteristics between arms of the trial, in an unlikely scenario of imbalance in cRCT (Klar and Donner, 2001).

The adjusted analysis shows that the intervention has had no effect on full immunization in 12-23 month old children as the odds ratio is close to 1 (OR= 0.97, 95% CI (0.70,1.34)). Also, the odds of receiving all three doses of DPT among 6-23 months old children is similar across the intervention and control arms. The results for the adjusted and unadjusted analyses are very similar.

None of the subgroups based on various factors - district, gender of the child, birth order of the child and village baseline full immunization coverage, show a significant effect of the intervention on either of the primary outcomes. However, some of the results were promising, but they were not statistically significant. For example, in villages that had a low full immunization coverage at baseline, children in the intervention arm were 1.4 times more likely to receive all three doses of DPT than children in the control arm. However, this finding was not statistically significant.

RCTs of complex interventions like SALT are often criticised as being a 'black box' as it can be difficult to know why and how the intervention worked (or not) (Grant et al., 2013). The absence of an impact, as in our study, could be simply because SALT was ineffective in this particular context or it could potentially be because of less than optimal implementation of the intervention. We made an attempt to collect relevant process indicators to be able to share some insights in explaining the findings from the evaluation study. The potential reasons behind the evidence of no impact of the intervention in improving immunization coverage are elaborated below.

Less than optimal reach of the intervention. To understand the uptake of the intervention, it is pertinent to know what proportion of households or individuals in the community participated in the SALT intervention. The summary findings from the process data, as presented in the results section, suggest less than optimal reach and coverage of the intervention. On the other hand, we do not have specific information on whether the households selected for endline evaluation were exposed to the SALT community engagement intervention or not. Our endline survey did not include questions regarding participation of selected households in SALT activities. Inclusion of direct questions would have made it evident to the field data collectors the identity of intervention villages based on positive responses from couple of households, violating the principle of blinding outcome assessors in a RCT which can lead to substantial bias in the outcome variable (Guyatt et al., 2011, Moher et al., 2012, Higgins et al., 2019, di Ruffano et al., 2017). Moreover, it was not straightforward to define exposure to the intervention of the study participants for a multi-step complex intervention like SALT as all steps are interrelated. However, findings from the focus group discussions during endline evaluation suggest that considerable number of

households in the intervention villages did not hear about the intervention or barely participated in the intervention.

The intervention could potentially have been more targeted in order to reach the last mile. After our baseline assessment (June-August 2016), we found that all three study districts had significantly higher immunization coverage compared to the earlier assessment by NFHS-4 (November 2015 – March 2016). We postulate that one reason for the sudden jump in immunization coverage could be the widespread implementation of Mission Indradhanush, a supplementary immunization programme of the Government of India, in the study districts prior to this study (November 2015-February 2016) and also in selected blocks during the study. For example, in rural Bongaigaon the coverage of three doses of DPT among children in the age group of 12-23 month was 69% according to NFHS-4. Our baseline survey found the DPT-3 coverage in rural Bongaigaon to be significantly higher (79%) among 6-23 months old children. Similar findings hold true for the other two districts as well. Given the already high level of coverage, to achieve further improvement through SALT intervention, it would have been better if the intervention was adapted to engage with the marginalized and hard to reach population in a targeted manner. A strategy of community mobilisation and targeted community-based health and immunisation camps during polio immunisation campaigns in high-risk, conflict-affected areas of Pakistan was successful in increasing polio vaccine coverage (Habib et al., 2017). While within village transfer and sharing of learning among households was one of the assumptions of SALT intervention, this might not have happened as expected during the implementation of the intervention.

Limited time frame for a complex and ambitious intervention. Any behavioral change takes time and requires sustained effort until a critical mass is reached, more so if it requires identifying and reaching out to the population who are usually left out from the health system and its immunization service delivery. The limited time frame for the SALT intervention was perhaps inadequate for sustained interactions with the community as a whole so that a sense of ownership is developed at the community level regarding the issue of children's immunization. Although the specific steps of the intervention's learning cycle allow a community to divide an apparently insurmountable challenge into a number of manageable steps, it was nonetheless a difficult concept to grasp both for the facilitators as well as for the communities. Allowing more time for training and implementation of the intervention could have helped improve uptake and achieve the desired level of community ownership. To address vaccine hesitancy in US, a relatively longer term intervention that was implemented for three years showed the promise of using parent advocates as part of a community-based approach to reduce vaccine hesitancy (Schoeppe et al., 2017).

Conflict between the idea of community ownership and some level of 'coercion' in implementation. The SALT approach being grounded in a democratic, sensitive and ethical approach, ideally, it would be the community that is supposed to set their own priorities during the implementation. It is quite natural that some communities may not prioritize immunization if there are other pressing issues prevalent in the community. Our experience of process evaluation suggests that many communities initially did not perceive immunization as a major problem. However, child health was accepted by all villages as a shared dream, and it was through this dream the facilitators stimulated the discussion around immunization. The objective of the study was to evaluate the impact of SALT in increasing immunization coverage. So naturally, the facilitators had to stimulate the

discussion so that immunization related issues ‘emerged’ as a topic during dream building and practices around immunization are taken up for developing action plans. In one sense, this is a conflict between the idea of community ownership/decision making and some level of external pressure (‘coercion’) from the facilitator during the implementation of the intervention. For a lucid description of the reflections from the lead implementing agency Constellation, the readers are referred to Appendix A.

In the context of evaluating community engagement interventions (CEIs), our study raised some important concerns and dilemma for the evaluators. First, what are the appropriate metrics to measure success of a CEI? It is possible that a CEI having a very limited reach and coverage with respect to the whole community might lead to improvement in outcome of interest, if targeted properly. For example, had we only recruited households having pregnant women in villages before the start of the intervention and implemented SALT only on the selected households in the community, we could have possibly observed better immunization outcomes at endline among children from the intervention villages relative to the control villages because the implementation would have been more targeted and would have utilized the resources in an efficient manner. However, it may not lead to sustainable improvement in immunization outcomes or development of community ownership of the issue of immunization as the majority of the community members would have remained unexposed to the intervention. Secondly, which is a more appropriate design choice in evaluating CEIs? One commonly used method is to follow the cohort design, i.e., to recruit participants at baseline, implement the intervention on the recruited participants from the community, and use the same set of participants for evaluating outcomes at endline. If the extent of reach and coverage of the intervention is an important metric for measuring success of a CEI, this design choice may not be the ideal as it ignores the metrics in evaluation. It would perhaps be more appropriate to consider repeated cross sectional design, as we did in our study, where the communities remain the same at baseline and endline, but a new random sample of eligible participants are recruited at endline for evaluation of outcomes. This design choice can be considered as a conservative approach of evaluating CEIs. If wider exposure of the intervention in the community is expected from a CEI, then this particular design choice promotes evaluation after accounting for that metric. For example, the impact evaluation study of reaching married adolescents (RMA) program in Niger follows up the 25 recruited couples every month and counsel them individually and in smaller groups (Challa et al., 2019). At the end of the intervention, the study assesses the same set of couples for evaluation outcomes based on their reported use of modern contraceptive method. Even if the evaluation finds improved uptake of modern contraceptive method, the question remains whether there would be a sustainable change in the community among adolescent girls and their husbands once the intervention period is over. Moreover, since the 25 couples have been counselled regularly, conformity and social desirability considerations may lead to higher reporting of use of modern contraceptive methods than the actual practice. So this particular evaluation study of community-based program, by using a cohort design, may end up introducing some kind of Hawthorne effect (McCambridge et al., 2014, McCarney et al., 2007) and inflating the estimate of treatment effect.

Strengths of our study include the use of a theoretically grounded community engagement intervention and the use of robust methods to assess the intervention. The SALT community engagement intervention is participatory, interactive, prolonged and involves multiple inter-related steps. Based on the level of participation and involvement of the community,

community engagement interventions can be classified into five graded categories ranging from inform, consult, involve, collaborate and empower; the last being the highest form of engagement (Victorian Auditor-General, 2017). Most common intervention strategies in public health include providing education and advice which can be considered as low-level of community engagement (O'Mara-Eves et al., 2015). The next common intervention strategies provide social support and skill development training through involvement with the community and can be classified as mid-level of community engagement. The SALT intervention comes in the latter category of empowering the community. The internal validity of our impact evaluation study is justified through identification of a comparable control group, selection of clusters and participants using probability sampling design, consideration of a sample size adequate to detect programmatically significant effect size with recommended statistical power, random allocation of clusters to the intervention and control groups ensuring treatment allocation being independent of outcome, measurement of relevant covariates at the participant and cluster level (Pramanik et al., 2018).

Our impact evaluation study includes two primary outcomes – full immunization in 12-23 months old children and three doses of DPT in 6-23 months old children. Having two primary outcomes may require adjustment for multiplicity of testing. However, the two age-groups overlap and the two outcomes are strongly correlated. It would be difficult to control the error rate without being overly conservative. We, therefore, made no adjustments for multiplicity of testing. Moreover, the vaccination outcomes are constructed using information recorded from vaccination cards and that elicited from mothers. Depending on the age of the child and complexity of vaccination schedule, accuracy of mother's recall data is questionable. On the other hand, vaccination card may be unavailable, or all vaccinations may not be recorded accurately in the card (Pramanik, 2016). Sensitivity analysis suggest that coverage rates are different depending on the data source used for defining child's vaccination status – vaccination card only, mother's recall only and combination of the two.

Qualitative data from intervention villages indicated that the SALT approach of community engagement has brought about improvements in attitude towards immunization in some of the target areas by addressing misconceptions about vaccines, initiating the practice of reading MCP cards and a change in attitudes towards vaccination as compared to baseline data, but some of these changes were also reported in control villages. Health workers asserted that ownership of immunization by the community can play a pivotal role in increasing immunization coverage and that the SALT approach supported community engagement. While several villages acknowledged the contribution of frontline health workers in some instances they expressed concerns about inadequate information from health workers, which in a way acted as a barrier in acceptance of vaccines. In addition, the SALT intervention reportedly consolidated unity and solidarity among people, bringing them together to address the issues concerning their community at large. It provided them a platform to discuss and chalk out a strategy to fulfil the dreams they agreed upon for their village and children.

Overall the qualitative data showed mixed results: while many mothers and grandmothers present at FGDs were aware of aspects of the CLCP/SALT process (but not the name/ acronyms used), there were many members of the community who were not aware of the CLCP/SALT process. This perhaps suggests that within village dissemination of the process was not as efficient as anticipated at the start. Villagers who were aware of the SALT

process reported benefits both in increasing immunization awareness and utilization and additional benefits outside the context of immunization.

Although stratified sampling was used to ensure that selected districts are representative in terms of socio-demographic diversity of Assam, the districts were purposefully selected so that they were reachable within 3-4 hours' drive from the central location of Guwahati. We should therefore exercise caution while generalizing the study findings to other parts of the state and the country.

11 Policy implications and recommendations

Community engagement intervention like SALT, in theory, has the potential to improve immunization coverage as it can help identify barriers to vaccination at the local level and thus might lead to customized and sustainable solutions. The findings from this evaluation study based on a cluster randomized controlled trial, however, showed no effect of the SALT intervention on children's immunization coverage in our study population after one year of implementation. But qualitative data showed that there were some positive changes taking place in smaller pockets of villages. The fact that persons with little educational qualifications could participate and engage in a self-evaluation exercise after defining a self-evaluation rubric was noteworthy.

With the flexibility this approach gives to the community to prioritise an issue, it is quite natural that some communities may not prioritize the issue of childhood immunization if there are other pressing issues prevalent in the community. This is particularly true here when, the communities do not perceive immunization as a major problem given the improved immunization service delivery provided by the National Health Mission of the Government of India. Any behavioral change takes time and sustained effort until a critical mass is achieved. In the context of immunization, if we want to reach out to the left-out population, it may require sustained interaction over a longer period of time within the community, this is potentially where the SALT approach could help. Although the steps of the intervention's learning cycle allow a community to divide an apparently insurmountable challenge into a set of specific and manageable steps, it is nonetheless a difficult concept to grasp both for the facilitators as well as for the communities. More intensive training of facilitators and supportive visits could help improve uptake.

As observed from the national level surveys on immunization, the coverage in most areas (like the study districts) is not very low; neither is it at the optimum desired level. In order to achieve the desired level of coverage, it is important to engage with the marginalized and hard to reach population. During the implementation of the intervention, an emphasis on reaching out to the target sub-groups of the community could be of additional benefit. While within village dissemination of the process was assumed, this clearly did not happen to an optimal level. Hence more thought could be given to how a community is defined for operational purposes of an intervention.

The null results from our study suggest that a more targeted implementation strategy may be the way forward if SALT community engagement intervention has to be effective across various contexts. Behavior change in villages could take time and requires sustained effort. We believe that the SALT approach may be better suited in situations that target a smaller group of individuals or where the issue is perceived as a priority by the community and

emerges organically through discussions, for instance, in villages with high prevalence of vaccine hesitancy.

Appendix A Reflections from the Constellation (lead implementing organization):

What we learned and what we did

The objective of the 3ie programme was to generate new evidence about what works to engage communities in increasing immunisation coverage. The project to test the SALT (Stimulate, Appreciate, Learn and Transfer) approach in Assam, India was one of 7 impact evaluation awards made by 3ie as part of this programme.

The SALT project in Assam consisted of interventions using the SALT approach in 90 communities in Assam: 30 communities in Bongaigaon, 30 communities in Udalguri and 30 communities in Kamrup. The intervention took place between April 2017 and April 2018. The work in Bongaigaon was carried out by the Voluntary Health Association of Assam (VHAA) and the Centre of North East Studies and Policy Research (C-NES). The Impact Evaluation was carried out by the Public Health Foundation of India (PHFI). The evaluation showed that the intervention had an insignificant impact at the end of one year on the uptake of immunisation in the 90 villages that were the target of the intervention. The work is described in detail in the report of which this reflection forms a part.

A.1 The essence of the SALT approach

The SALT approach used in this work is discussed in detail in the report. The essence of the SALT approach is that when communities take ownership of the challenges that they face, they will take action to overcome those challenges. Ownership drives action that will not be dependent on external stimulus; it is the foundation of sustainability.

In the context of SALT, ownership means that the community decides on the action that it wishes to take and that it takes that action. Ownership goes beyond consultation, engagement and empowerment. Ownership also does not mean the rejection of outside resources. However, there is a world of difference between outside experts telling people what to do and communities asking for the resources and expertise that they need to execute their own plans.

A.2 The major lessons from the Assam Project

The most profound learning to come from the Assam project for the SALT approach is that it brings an inevitable tension when the external objective (increasing the level of immunisation) does not have an equal priority with the community that is being invited to own that objective. We recognised this tension from the earliest days when we were considering if we should make an application. We rationalised that if we framed the project as being about 'Healthy Children' then we could square this circle. With some communities this worked out, but in many others, it was always clear that immunisation was never going to be a high priority for them. We saw the tensions throughout the project in a wide variety of ways. There is a real doubt in our minds as to whether our methodology was suited to the objective.

The second lesson is related to the first: The communities own the timing of the project—we do not. The external owner (3ie) of the project defines the period of the intervention (12 months). However, the communities have their own rhythms and these are the real drivers of the timing of their programme. There are periods of the agricultural cycle where the

community cannot and will not engage. Assam has a wonderful collection of festivals that are of the utmost importance. And more tragically when the Brahmaputra River floods the priority is survival. The project simply has to adapt to these ebbs and flows, but there is a pressure to deliver to a schedule that inevitably leads to a box ticking approach that is inconsistent with the development of ownership by the community.

The third lesson also relates to time. Our approach needs time at all levels. We simply cannot succumb to the tyranny of time. We tried to go directly to training the facilitators who were C-NES and VHAA staff. What is more our training was about how to facilitate the steps in the process. We were focused on the how to do things rather than why we were doing them. Ultimately, we recognised that this was causing confusion. The way we did things caused confusion both to the NGO management and the facilitators. Ultimately, we had to stop and focus on the thinking behind our approach and the inherent logic that sits within it. When we did this, we began to see an improvement in the confidence and the performance of our facilitators, but our initial approach lost us a significant amount of time.

A.3 The actions the Constellation took from what it learned

As we reached the end of the intervention phase of the project, the Constellation sensed that we were leaving with our work not complete. We saw the facilitators' skills and confidence growing rapidly and we saw the communities understanding that they could take action. We decided to raise funds to continue the intervention for a further year using the same facilitation resources. We returned to our usual way of working in that the community identified the issues that were important to them and defined action plans based on their own priorities. We were pleased, and relieved, to see a flowering of activities. Some communities continued to prioritise immunisation, while for others it was not an issue of importance. In this environment, the Constellation and the facilitators are far more comfortable.

At the end of the second year of intervention, we evaluated the results with Outcome Harvesting methodology. This evaluation observed some of the behaviour changes over a much broader area than immunisation coverage that we had hoped to see. Here are some quotations from a preliminary report of the study.

“The project showed a clear effect on various tangible issues, primarily water cleanliness, cleanliness and sanitation, immunization, nutrition, quality of education, and school dropout. While immunization was the main entry point for the project to address issues in the villages, it clearly also was able to raise awareness of a few other issues.”

“(One) strength of the approach is that it enables villages to create a linkage to existing schemes. In Kamrup, for example, a village was able to connect the school to the public water supply in order to ensure safe drinking water. In other villages, the community leaders had started to contact the government regarding the construction of public roads.”

“As the selection, of villages undermined the effectiveness of the project significantly, any follow up should consider addressing clusters of villages. It should further strengthen the spill over effects on neighbouring villages, possibly by actively encouraging outreach to neighbouring villages.....The utility of the project to instil and sustain behavioural changes is striking and unprecedented. While this effect cannot be measured in numbers, it becomes visible when young girls take the floor in front of the whole community or when fathers take their children to the vaccination appointments.”

We continue to explore the changes that have taken place in the communities in Assam.

A.4 The impact of the FCRA issue

The FCRA issue had a deep and pervasive impact on the programme. At the start of the project, we had no knowledge of the Foreign Contribution (Regulation) Act 2010 (FCRA). It came to dominate the project. Because the Constellation has no legal presence in India, we had to operate through an Indian host. From the start of the project, these hosts became caught up in the FCRA crisis. We had to arrange and rearrange our contract arrangements with Indian NGOs that had a valid FCRA (Samraksha and SIAAP). When PHFI also became almost paralysed by the FCRA further ways needed to be explored to make the programme work. Certainly, there were serious tensions within VHAA and between VHAA and its facilitators.

Perhaps it was only towards the end of the project that the Constellation began to understand just how much of our resources were taken up in dealing with the administrative issues. While this certainly took our attention away from other Constellation projects, it also reduced the attention that we were able to give to the support of the facilitators in the field. It was only with our internal review of the Assam Project, that we truly understood the deep and pervasive impact that the FCRA issue had on our involvement with the real work of the project.

A.5 Conclusion

We are left to question whether we need to be much more careful to define the scope of activity to which our approach should be applied. If an outside organisation has a specific objective perhaps our involved process is not appropriate. At the very least, we need to be comfortable that the community (or communities) need to have the same priority as the outside organisation.

Phil Forth
The Constellation

Appendix B Definition of vaccination outcomes

For each vaccine, mothers were asked whether the child had received the vaccination and the number of doses received, for vaccines requiring more than one dose. During the interview, mothers were asked to recall this information before the interviewer asked to see the child's vaccination card. The interviewer then noted down the dates (in DD/MM/YYYY format) for various vaccinations as recorded in the vaccination card. If the card indicated that a vaccine was administered but no date was recorded, then the interviewer noted it down by coding the corresponding date as '44/44/4444'. If the date was partially recorded in the vaccination card, the interviewer replaced the missing day, month or year with 99, 99 and 9999, respectively. We combined information from the card and mother's recall to define the vaccination status of the child for each of the vaccines. For different vaccines, to define whether the child received that vaccination or not, we followed the procedure described below.

B.1 DPT/Pentavalent vaccine

In order to define different doses of DPT/Pentavalent, first we define the variable from mother's recall. There are three relevant questions in the mother's recall section:

Q1. *Was a Penta (5-in-1) or DPT injection given in the thigh at the same time as the polio drops?*

Q2. *How many times was the Penta (5-in-1) or DPT vaccine given?*

Q3. *Were two injections given in two thighs along with polio drops during the same vaccination session?*

Based on the above-mentioned questions, we define **number of doses of DPT/Penta from mother's recall (MR_DPT/Penta_doses)** as follows:

Q1 response	Q2 response				Don't Know (99)	NA
	0	1	2	≥3		
Yes (1)	1	1	2	3	1	NA
No (2)	} 1 Q3 = 'Yes'					
	} 0 otherwise					
Don't Know (99)	} 1 Q3 = 'Yes'					
	} NA otherwise					

In cases where enumerator had seen vaccination card of child, we define **number of doses of DPT/Penta from vaccination card (VC_DPT/Penta_doses)** as follows:

Step1. Create binary variables **VC_DPT/Penta1**, **VC_DPT/Penta2**, and **VC_DPT/Penta3**.

VC_DPT/Penta1 was defined as 1 if

- there was a full date (DD/MM/YYYY) corresponding to DPT1 or Penta1.

- The card indicated that either DPT1 or Penta1 was given (date recorded as '44/44/4444' for either DPT1 or Penta1).
- Part of the date was available (coded as '99' for missing day or month and as '9999' for missing year) for either DPT1 or Penta1

VC_DPT/Penta1 was defined as 0 if there was no record of vaccination in the card corresponding to DPT1 and Penta1 (coded as '0/0/0' or '99/99/9999')

Similarly, create binary variables **VC_DPT/Penta2** based on date entries for DPT2 and Penta2 and **VC_DPT/Penta3** based on date entries for DPT3 and Penta3, in the vaccination card.

Step2. Define **VC_DPT/Penta_doses** counting the number of DPT/Penta doses based on vaccination card as sum of **VC_DPT/Penta1**, **VC_DPT/Penta2** and **VC_DPT/Penta3**.

Step 3. We define the outcome variable **DPT/Penta_doses** by combining information from **MR_DPT/Penta_doses** and **VC_DPT/Penta_doses**

VC_DPT/Penta_doses	MR_DPT/Penta_doses				
	0	1	2	3	NA
0*	0	1	1	1	0
1^a	1	1	1	1	1
2^b	2	2	2	2	2
3^c	3	3	3	3	3
NA (no vaccination card)	0	1	2	3	NA

* coded as '0/0/0' or '99/99/9999' for all DPT and Penta date fields

^a full date or partial date or '44/44/4444' for exactly one of three doses of DPT or Penta

^b full date or partial date or '44/44/4444' for exactly two of three doses of DPT or Penta

^c full date or partial date or '44/44/4444' for all three doses of DPT or Penta

B.2 BCG/Measles vaccine

First, based on mother's recall, define vaccination status of child (MR_vaccine) as follows:

MR_vaccine = $\begin{cases} 1 & \text{if mother reported 'yes'} \\ 0 & \text{if mother reported 'no'} \\ \text{NA (missing)} & \text{if mother reported 'don't know'} \end{cases}$

Then define vaccination status of child based on vaccination card (VC_vaccine) for those whom vaccination card was seen by interviewer, as follows:

VC_vaccine = $\begin{cases} 0 & \text{vaccine date coded as '0/0/0' or '99/99/9999'} \\ 1 & \text{otherwise (1 full date or partial date or '44/44/4444')} \end{cases}$

Based on **MR_vacc** and **VC_vacc**, we then define **vacc** (vaccination status of child) as follows:

VC_vacc	MR_vacc		
	0	1	NA
0	0	1	0
1	1	1	1
NA (no vaccination card)	0	1	NA

B.3 Polio vaccine

Step 1. First we define the variable: **number of doses of polio vaccine received** from mother's recall. The mother was asked:

How many times was the polio drop given till date? (Exclude birth dose)

Based on the above question, we define **number of doses of polio vaccine received** from mother's recall (**MR_polio_doses**) as follows:

MR_polio_doses =

- 0 if mother reported 0 dose
- 1 if mother reported 1 dose
- 2 if mother reported 2 doses
- 3 if mother reported greater than or equal to 3 doses
- NA (missing) if mother reported 'don't know'

In cases where enumerator had seen vaccination card of child, we define **number of doses of polio received** from vaccination card (**VC_polio_doses**) as follows:

Step1. Create binary variables **VC_polio1**, **VC_polio2**, and **VC_polio3**.

VC_polio1 was defined as 1 if

- there was a valid full date (DD/MM/YYYY) corresponding to OPV-1.
- The card indicated that OPV-1 was given (date recorded as '44/44/4444' for OPV-1).
- Part of the date was available (coded as '99' for missing day or month and as '9999' for missing year) for OPV-1

VC_polio1 was defined as 0 if there was no record of vaccination in the card corresponding to OPV-1 (coded as '0/0/0' or '99/99/9999')

Similarly, create binary variables **VC_polio2** based on date entries for OPV-2 and **VC_polio3** based on date entries for OPV-3, in the vaccination card.

Step2. Define **VC_polio_doses** counting the number of polio doses based on vaccination card as sum of **VC_polio1**, **VC_polio2** and **VC_polio3**.

Step 3. We define the outcome variable **polio_doses** by combining information from **MR_polio_doses** and **VC_polio_doses**

VC_polio_doses	MR_polio_doses				
	0	1	2	3	NA
0*	0	1	1	1	0
1^a	1	1	1	1	1
2^b	2	2	2	2	2
3^c	3	3	3	3	3
NA (no vaccination card)	0	1	2	3	NA

* coded as '0/0/0' or '99/99/9999' for OPV-1, OPV-2 and OPV-3 date fields

^a full date or partial date or '44/44/4444' for exactly one of OPV-1, OPV-2 and OPV-3

^b full date or partial date or '44/44/4444' for exactly two of OPV-1, OPV-2 and OPV-3

^c full date or partial date or '44/44/4444' for all three - OPV-1, OPV-2 and OPV-3

Appendix C District-wise village-level process indicators

Table 13: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Bongaigaon district and SALT Facilitator BN_FL01

Sl. No	Village name	Total no. of HHs [#]	No. of visits made to this vill	HHs covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	Karebari	243	13	29	2	5	Yes (Jan'18)	Yes	Yes (Jan'18, Feb'18 [^])	Yes, Yes [^]	Yes, Yes [^]	1
2	Majgaon Pt II	183	21	48	5	5	Yes (Oct'17)	Yes	Yes (Oct'17, Jan'18 [^])	Yes	Yes	4
3	Kushiakata	157	18	43	4	4	Yes (July'17)	Yes	Yes (July'17, Dec'17 [^])	Yes, No [^]	Yes	4
4	FouzdarDewan Para	184	20	43	3	4	Yes (August'17)	Yes	Yes (August'17, Dec'17 [^])	Yes, No [^]	Yes	4
5	Chakrasila No.2	166	16	34	4	3	Yes (June'17)	Yes	Yes (June'17, Jan'18 [^])	Yes	Yes	3
6	Chalabila No.2	198	16	33	4	5	Yes (Sept'17)	Yes	Yes (Sept'17, Jan'18 [^])	Yes	Yes	4
7	MulagaonChennapara	80	17	16	4	5	Yes (Dec'17)	Yes	Yes (Dec'17, Feb'18 [^])	Yes, Yes [^]	Yes, Yes [^]	1
8	Bajitpara	263	16	43	2	3	Yes (Jan'18)	Yes	Yes (Jan'18)	Yes	Yes	1
9	Nayapara Pt I	354	22	40	4	6	Yes (Oct'17)	Yes	Yes (Oct'17, Jan'18 [^])	Yes	Yes	4
10	Bashbari No. 4	340	16	24	6	6	Yes (Nov'17)	Yes	Yes (Nov'17, Feb'18 [^])	Yes, Yes [^]	Yes, Yes [^]	3

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders. [^]Revisiting SALT steps (self-assessment or action plan).

Data on exact duration (months) of action phase is not available from the implementation agency.

Table 14: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Bongaigaon district and SALT Facilitator BN_FL02

Sl. No	Village name	Total no. of HHs #	No. of visits made to this vill	HHs covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	Kheluapara Pt VI	250	17	41	3	7	Yes (Oct'17)	Yes	Yes (Oct'17, Jan'18^)	Yes	Yes	4
2	Kheluapara Pt VII	205	18	46	4	7	Yes (Oct'17)	Yes	Yes (Oct'17, Jan'18^)	Yes	Yes	4
3	Barghola Pt I	168	22	62	5	6	Yes (August'17)	Yes	Yes (August'17, Jan'18^)	Yes	Yes	6
4	Chatpara N.C.	156	20	41	6	7	Yes (Sept'17)	Yes	Yes (Sept'17, Feb'18^)	Yes, Yes^	Yes, Yes^	3
5	Kerkhabari Pt II	150	20	38	4	8	Yes (Sept'17)	Yes	Yes (Sept'17, Jan'18^)	Yes	Yes	5
6	Uttar Khoragaon Pt I	202	20	43	4	6	Yes (Nov'17)	Yes	Yes (Nov'17)	Yes	Yes	5
7	Tinkonia Pt II	153	19	48	3	6	Yes (Nov'17)	Yes	Yes (Nov'17, Feb'18^)	Yes, Yes^	Yes, Yes^	4
8	Tinkonia Pt I	214	22	37	12	6	Yes (June'17)	Yes	Yes (June'17, July'17, Feb'18^)	Yes, Yes^	Yes, Yes^	3
9	No.6 Char	161	14	22	3	6	Yes (Jan'18)	Yes	Yes (Jan'18)	Yes	Yes	3
10	Kanara Beel*	274	22	59	5	8	Yes (July'17)	Yes	Yes (July'17, Oct'17^)	Yes	Yes, No	5

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders. ^Revisiting SALT steps (self-assessment or action plan).

Data on exact duration (months) of action phase is not available from the implementation agency.

Table 15: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Bongaigaon district and SALT Facilitator BN_FL03

Sl. No	Village name	Total no. of HHs#	No. of visits made to this vill	HHs covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	Sonakhuli Pt II	232	20	43	5	4	Yes (Sept'17)	Yes	Yes (Sept'17, Jan'18^)	Yes	Yes	2
2	Nakapara (Nayapara)	215	22	40	9	6	Yes (June'17)	Yes	Yes (June'17, Dec'17^)	Yes, Yes^	Yes	3
3	Bakhalgaon Pt I	226	20	42	6	7	Yes (Oct'17)	Yes	Yes (Oct'17, Jan'18^)	Yes	Yes	2
4	Harir Char Pt I	209	10	22	2	2	Yes (Dec'17)	Yes	Yes (Dec'17)	Yes	Yes	1
5	Dumuria Pt III	92	26	60	7	7	Yes (July'17)	Yes	Yes (July'17)	Yes	Yes	5
6	Dumerguri Pt II	164	15	36	4	3	Yes (August'17)	Yes	Yes (August'17, Dec'17^)	Yes, Yes^	Yes	2
7	Bharalipara Pt II	259	13	33	2	4	Yes (Nov'17)	Yes	Yes (Nov'17)	Yes	Yes	2
8	Baghakhaiti	129	13	24	3	4	Yes (Oct'17)	Yes	Yes (Oct'17)	Yes	Yes	2
9	Pachania Pt I	105	19	33	6	6	Yes (August'17)	Yes	Yes (August'17, Jan'18^)	Yes	Yes	3
10	Barjana Pt II	248	18	42	3	4	Yes (Sept'17)	Yes	Yes (Sept'17, Jan'18^)	Yes	Yes	3

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders. ^Revisiting SALT steps (self-assessment or action plan).

Data on exact duration (months) of action phase is not available from the implementation agency.

Table 16: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Kamrup rural district and SALT Facilitator KM_FL01

Sl. No	Village name	Total no. of HHs#	No. of visits made to this vill	HHs covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	Dihina	235	12	33	9	5	Yes (Dec'17)	Yes	Yes (Dec'17, March'18^)	Yes	Yes	1
2	Haldha	159	14	44	9	5	Yes (Nov'17)	Yes	Yes (Nov'17, March'18^)	Yes	Yes	3
3	Hirajani	150	14	33	9	7	Yes (Oct'17)	Yes	Yes (Oct'17, March'18^)	Yes	Yes	0
4	Nadia	138	13	41	7	6	Yes (Sept'17)	Yes	Yes (Sept'17, March'18^)	Yes	Yes	0
5	Borsapori	260	12	33	6	6	Yes (June'17)	Yes	Yes (June'17, March'18^)	Yes	Yes	1
6	Silamahekhaity	218	13	40	8	5	Yes (Oct'17)	Yes	Yes (Oct'17, March'18^)	Yes	Yes	1
7	Hahdia	199	12	37	9	4	Yes (July'17)	Yes	Yes (Sept'17, March'18^)	Yes	Yes	2
8	Borka	641	15	48	8	6	Yes (Oct'17)	Yes	Yes (Oct'17, March'18^)	Yes	Yes	1
9	Tulsikharikata	269	15	45	11	6	Yes (Jan'18)	Yes	Yes (Jan'18, March'18^)	Yes	Yes	2
10	Mazgaon	195	16	49	8	6	Yes (Nov'17)	Yes	Yes (Nov'17, March'18^)	Yes	Yes	1

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders. ^Revisiting SALT steps (self-assessment or action plan).

Data on exact duration (months) of action phase is not available from the implementation agency.

Table 17: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Kamrup rural district and SALT Facilitator KM_FL02

Sl. No	Village name	Total no. of HHs [#]	No. of visits made to this vill	HHs covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	Khatkhati	172	15	45	3	3	Yes (Nov'17)	Yes	Yes (Nov'17, March'18 [^])	Yes	Yes	3
2	Agchia	339	12	30	3	4	Yes (Sept'17)	Yes	Yes (Sept'17, March'18 [^])	Yes	Yes	4
3	Pukhuripara	251	13	35	2	3	Yes (August'17)	Yes	Yes (August'17, March'18 [^])	Yes	Yes	4
4	Jongakholi	190	14	36	2	3	Yes (Oct'17)	Yes	Yes (Oct'17, March'18 [^])	Yes	Yes	3
5	Mokaibari	100	16	45	6	4	Yes (Feb'18)	Yes	Yes (Feb'18, March'18 [^])	Yes	Yes	0
6	Pasgumi	280	12	29	6	4	Yes (Oct'17)	Yes	Yes (Oct'17, March'18 [^])	Yes	Yes	6
7	Majpara	239	10	22	2	2	Yes (June'17)	Yes	Yes (June, July'17, March'18 [^])	Yes	Yes	3
8	PachimDhuli	398	14	39	5	3	Yes (Oct'17)	Yes	Yes (Oct'17, March'18 [^])	Yes	Yes	1
9	Nadiapara	370	14	39	6	7	Yes (Jan'18)	Yes	Yes (Jan'18, March'18 [^])	Yes	Yes	2
10	Jalukbari FV	197	8	17	6	7	Yes (Dec'17)	Yes	Yes (Dec'17, March'18 [^])	Yes	Yes	2

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders. [^]Revisiting SALT steps (self-assessment or action plan).

Data on exact duration (months) of action phase is not available from the implementation agency.

Table 18: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Kamrup rural district and SALT Facilitator KM_FL03

Sl. No	Village name	Total no. of HHs [#]	No. of visits made to this vill	HHs covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	Barkukuria	195	14	35	3	4	Yes (Nov'17)	Yes	Yes (Nov'17)	Yes	Yes	1
2	Rajapanichanda	118	20	56	4	3	No	NA	NA	NA	NA	0
3	Karaibari	185	15	44	1	2	Yes (Oct'17)	Yes	Yes (Oct'17)	Yes	Yes	2
4	Dimu No. 1	216	16	42	2	5	Yes (Oct'17)	Yes	Yes (Oct'17)	Yes	Yes	1
5	Satgaon	200	14	41	1	4	Yes (Jan'18)	Yes	Yes (Jan'18)	Yes	Yes	1
6	Uttar Bordol	164	13	38	4	4	Yes (Sept'17)	Yes	Yes (Sept'17)	Yes	Yes	2
7	Hiragata	209	12	35	3	3	Yes (August'17)	Yes	Yes (August'17)	Yes	Yes	1
8	Ischadagharia	399	15	45	4	3	Yes (Dec'17)	Yes	Yes (Dec'17)	Yes	Yes	1
9	Larmagourhati	198	20	59	3	3	No	NA	NA	NA	NA	0
10	PurnaKhumdum	190	17	55	4	3	Yes (Jan'18)	Yes	Yes (Jan'18)	Yes	Yes	1

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders.

Data on exact duration (months) of action phase is not available from the implementation agency.

Table 19: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Udalguri district and SALT Facilitator UG_FL01

Sl. No	Village name	Total no. of HHs #	No. of visits made to this vill	HHs covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	PuraniHapagaon	134	18	70	0	3	Yes (Dec'17)	Yes	Yes (Dec'17)	Yes	Yes	2
2	SantipurGaon	196	19	33	7	2	Yes (Nov'17)	Yes	Yes (Nov'17)	Yes	Yes	3
3	BuraPujasali	150	24	30	9	2	Yes (August'17)	Yes	Yes (August'17, Nov'17, March'18^)	Yes	Yes	2
4	No.2 NizGarujhar	190	22	28	7	0	Yes (August'17)	Yes	Yes (August'17)	Yes	Yes	1
5	No.1 BoinaraSatra	209	18	35	4	1	Yes (June'17)	Yes	Yes (June'17)	Yes	Yes	3
6	Arangapara	230	20	66	3	3	Yes (Dec'17)	Yes	Yes (Dec'17, March'18^)	Yes	Yes	2
7	BanderiGaon	196	17	31	4	0	Yes (Oct'17)	Yes	Yes (Oct'17, March'18^)	Yes	Yes	2
8	Dewa Guri	194	21	38	7	0	Yes (July'17)	Yes	Yes, (July'17, March'18^)	Yes	Yes	1
9	Saikiapara	216	20	36	4	1	Yes (Nov'17)	Yes	Yes (Nov'17, March'18^)	Yes	Yes	1
10	Tamulbari	180	25	59	7	2	Yes (Oct'17)	Yes	Yes (Oct'17, March'18^)	Yes	Yes	3

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders. ^Revisiting SALT steps (self-assessment or action plan).

Data on exact duration (months) of action phase is not available from the implementation agency.

Table 20: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Udalguri district and SALT Facilitator UG_FL02

Sl. No	Village name	Total no. of HHs #	No. of visits made to this vill	HHS covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	Batabari	171	23	32	9	4	Yes (August'17)	Yes	Yes (August'17, Sept'17^)	Yes	Yes	3
2	Kachubil Nepali Gaon	188	19	32	5	3	Yes (Nov'17)	Yes	Yes (Nov'17)	Yes	Yes	2
3	Tarabari	259	22	45	8	0	Yes (August'17)	Yes	Yes (August'17, March'18^)	Yes	Yes	1
4	Bhairaguri	166	23	63	4	1	Yes (Oct'17)	Yes	Yes (Oct'17)	Yes	Yes	2
5	Harisinga Station Block	302	25	93	5	3	Yes (Dec'17)	Yes	Yes (Dec'17)	Yes	Yes	3
6	Anadhowapara	229	24	38	8	4	Yes (July'17)	Yes	Yes (July'17, March'18^)	Yes	Yes	2
7	No 2 Suklaikhuti	233	22	45	4	3	Yes (Oct'17)	Yes	Yes (Nov'17, March'18^)	Yes	Yes	2
8	Simaluguri	181	21	82	4	2	Yes (Dec'17)	Yes	Yes (Dec'17)	Yes	Yes	2
9	No 3 Barangajuli	151	19	29	8	0	Yes (July'17)	Yes	Yes (July'17, March'18^)	Yes	Yes	1
10	Chaibari	176	16	41	4	2	Yes (Nov'17)	Yes	Yes (Nov'17)	Yes	Yes	2

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders. ^Revisiting SALT steps (self-assessment or action plan).

Data on exact duration (months) of action phase is not available from the implementation agency.

Table 21: Village-level process indicators as recorded by the implementation agencies based on the format developed by the evaluation team: Udalguri district and SALT Facilitator UG_FL03

Sl. No	Village name	Total no. of HHs#	No. of visits made to this vill	HHs covered by SALT home visits	No. of community meetings	No. of meetings involving specific groups*	Dream building (DB) happened? (Month)	Did immunization emerge as a topic during DB?	Self-assessment (SA) happened? (Month)	Were practices around immunization discussed during SA?	Developed an action plan based on 3 practices?	No. of follow up visits of action plan
1	Mazarchuba	160	16	28	1	1	Yes (Jan'18)	Yes	Yes (Jan'18)	Yes	Yes	2
2	Habibhanga	177	19	44	1	2	Yes (March'18)	Yes	Yes (March'18)	Yes	Yes	1
3	Kadamguri	162	20	40	4	3	Yes (Nov'17)	Yes	Yes (Nov'17)	Yes	Yes	5
4	Dumaruguri	261	19	38	4	3	Yes (Nov'17)	Yes	Yes (Nov'17, Feb'18^)	Yes	Yes	3
5	Ganakpara	180	20	44	4	3	Yes (Nov'17)	Yes	Yes (Nov'17)	Yes	Yes	2
6	Merabil No.2	173	13	35	0	2	Yes (March'18)	Yes	Yes (March'18)	Yes	Yes	1
7	Jingabil	156	12	25	0	2	Yes (March'18)	Yes	Yes (March'18)	Yes	Yes	1
8	SilpotaBoriGاون	271	18	38	0	4	Yes (March'18)	Yes	Yes (March'18)	Yes	Yes	1
9	Hatipota No.1	218	22	43	4	3	Yes (Jan'18)	Yes	Yes (Jan'18, Feb'18^)	Yes	Yes	2
10	Chilabandha	190	18	32	0	1	Yes (Jan'18)	Yes	Yes (Jan'18, Feb'18^)	Yes	Yes	2

As per our houselisting data. * Such as CBOs/ SHGs/ Health workers/religious leaders. ^Revisiting SALT steps (self-assessment or action plan).

Data on exact duration (months) of action phase is not available from the implementation agency.

Appendix D Qualitative data – additional material

D.1 Community perceptions on child health

This section draws on the interactions with community members. Their perception on health issues pertaining to children and the broader context of the available health infrastructure is discussed. This section highlights communities' understanding of healthy children, and the ways this knowledge gets shared among the community.

The respondents stated that their children mostly suffered from minor ailments such as cold, cough, fever, diarrhoea, pneumonia, and vomiting. Jaundice was also reported in a few communities. In addition, skin infections such as skin rashes and itching were mentioned. In one FGD of Udalguri district, mothers stated that “*XoruAai*” and “*Boxonto*” (measles and skin infection) were more common in their community.

D.1.1 Perceptions of a healthy child

A majority of the respondents felt that a child who ‘*consumes healthy food and eats well*’ is a healthy child. Most of the people also expressed that ‘if a child is free from all kinds of diseases’, and whose “*hands and legs along with other organs of the body are functional*” then he/she is a healthy child.

Getting their child immunized in time with proper intake of vitamins (or nutritious food) was also seen as a sign of a healthy child by few respondents. Responses such as keeping a child ‘*clean and tidy*’, a child who ‘*looks good*’ and ‘*weighs well*’ were reported as signs of a healthy child by community members. In addition, health and education were also related as important, when few respondents stated that ‘*one who is good in studies*’ is a healthy child.

D.1.2 Information sharing regarding child health

Several respondents said they shared or got information on immunization and other health issues within their family and community through meetings in Anganwadi centres or in sub-centres. A few mothers-in-law stated that they discussed within their family by sharing their knowledge with their daughters-in-law. In one FGD with the grandmothers of Kamrup rural district, respondents specified that although they used to share their knowledge within the community by helping or advising each other, when asked for examples they said there were no such cases/ issues yet where they had taken any initiatives to address them, thus suggesting this was perceived opinions rather than tangible moments of information sharing. Whereas in another FGD conducted with the mothers from the same district, the respondents said that along with the sharing of knowledge on health, they also conducted community prayers when many children suffer from illness at the same time. In addition, at endline, a couple of respondents stated that they used to conduct SHG meetings where the knowledge, benefits, side effects of vaccination were discussed. ASHA worker used to help them by clearing their doubts in such discussions.

“We have a SHG group in our village where we have discussions on immunization if we have doubt regarding certain vaccines and if we want to know about why this vaccination is important or what are the possible side effects of it we ask the ASHA who later clears all our doubts. We ask the ASHA everything, in fact we take the ASHA along whenever we need her help regarding health”.

“We have developed a lot in this sector of immunization now, earlier there were instances where people did not take their child for vaccination. But since nowadays the ASHAs are carrying forward this duty of immunization, people now take their child for immunization” (FGD Mothers-09, Kamrup Rural)

D.1.3 Access to health facilities

Most of the respondents gathered were of the view that people had to go outside their village to avail health services. The absence of medical services in the villages compelled them to travel miles in order to get public sector treatment. In instances of serious health ailments, they had to access the private health care, which at times referred them to Guwahati for further treatment. Few respondents also stated that they had to hire private vehicles to travel a distance of 30-40 kilometres for getting emergency health care services, which in turn added to their financial burden.

Many respondents stated their desire of having a hospital in their village that will at least provide basic treatment to the people. Sub-centres in the public health system were seen as places for immunization services alone.

D.2 Perceptions and experiences around immunization

This section unpacks communities’ perceptions towards immunisation, their opinions on vaccination. It also highlights their role in improving vaccination. This section also helps understand decision making aspect of child immunisation at the family level.

D.2.1 ASHA perceptions and experiences on immunization

In the KIIs conducted with ASHAs and ASHA supervisors most of them shared their difficulty in convincing people for vaccination. Reflecting on their initial years of service, they said at times, to convince people, they had to approach each and every household along with the ANM or the health worker.

As reported by ASHAs the mothers-in-law were not able to accept the concept of vaccination. They apparently argued on the ground that they had children too and that they never took them for any vaccination, that post vaccination the child gets fever which causes sleep disturbance for the child and in turn negatively affects the whole family. One respondent from Bongaigaon district said that when she joined as ASHA worker a year ago, the people from her community had misconceptions regarding vaccines. The community perceived that the vaccines like polio and rubella were given to their children to decrease their fertility capacity but reportedly these perceptions had changed over the course of the year.

The ASHA Worker of Parerchar Pt. II (a control village in Bongaigaon District) said:

“Earlier people had misconception on vaccines. Say for example people used to think that if polio is given to children they will lose their power to reproduce. But such misconceptions do not exist now. Similarly, for the rubella vaccine what people used to think earlier has changed. There has been a change in the perception of people as compared to earlier times.” (KII ASHA Worker-09, Bongaigaon)

ASHAs added that in the current time the scenario is largely different. Due to continuous awareness meetings and community gatherings regarding immunization and its side effects, people have become fully aware of immunisation and now they voluntarily come forward to

vaccinate their child. Key informants further mentioned that in rare cases, it was seen that presence of a knowledgeable daughter in law in the family compelled families to vaccinate their children.

Almost all ASHA workers and ASHA supervisors believed that along with their approach, active community participation is required for increasing the immunization coverage.

“The society has a role to play in improving the immunization coverage. It is not only my sole responsibility. When I go around in the community to explain the importance of vaccination, people should understand that vaccines are for the benefit of children as it helps in protecting them from diseases. They should support me and also help in generating awareness among the people about the importance of vaccination.”(KII ASHA Worker-09, Bongaigaon)

Two ASHA workers from Bongaigaon district (control villages) lamented over lack of community initiatives for increasing the immunization coverage. They added that if the community unites together to take up some initiatives then they would welcome and support such initiatives. Other ASHA’s stated that they conducted gatherings and meetings with the help of Panchayati members, teachers and health workers at the Anganwadi centres and Self Help Group (SHG) meetings to increase the awareness of immunization.

The Health workers also opined that **community ownership of immunization** can help in minimising the gaps in achieving full immunization coverage. In one of the KIIs the respondent made the following comment

“People need to come on their own. They must not wait for others to motivate them. They should keep track of the things like immunization schedules for their children. They need to understand how to lead a healthy life and they need to go to ANMs, ASHA and APW to understand things about health and hygiene.” (KII ASHA Supervisor-01, Bongaigaon)

Some of the Health workers said that if some parents hesitate completing the vaccination doses of their child then it is their duty to explain to them every month until they realize its importance. Some people do fear giving multiple doses to their child but their explanations helps.

“We tell the parents in advance that you will have to come these many times to complete the vaccination for the sake of the baby’s health and future protection. Once they understand they do not say ‘no’.” (KII ASHA Supervisor-01, Bongaigaon)

D.2.2 Community perceptions on vaccination

Most of the parents were of the view that vaccinations keep their children away from illnesses and deadly diseases. Interestingly, people responded that in order to avoid polio they did not skip their vaccination dates. In an FGD in Bongaigaon, one such response recorded was ‘*One injection fights 5 big diseases*’ in order to see their children healthy in future and to protect them from all unwanted diseases they reported vaccinating their children.

“People have become responsible, you don’t have to ask them every time, and they realize their responsibilities of vaccinating their child.” (FGD Mothers-09, Kamrup Rural)

In contrast some members from the community stated that they have a *'right to know'*, as the reason behind vaccinating their children is never explained to them by any health worker be it ASHA or ANM. The non-response from health workers apparently remained even after being questioned by community members.

D.2.3 Decision making on immunization

When asked about who took the decision on vaccinating their children, most of the respondents mentioned that parents as well as the grandmothers made the decision. However, in one FGD conducted with the mothers from Kamrup rural they specified that fathers took the decision. A follow-up question regarding who usually takes responsibility of taking their child to the vaccination site, most respondents stated that it was mothers who carried their children for vaccination. In rare instances people mentioned that grandmothers accompanied mothers to the vaccination sites. None of them mentioned fathers, but stated that the fathers go for work so they were unable to take up that responsibility.

"The mother takes the child for immunization. The fathers go out for work and the mothers are the ones who stay at home. So they are the ones who take the child for vaccination." (FGD Fathers-02, Bongaigaon)

SALT facilitators in the SALT Whatsapp group, flagged that they come across instances where the fathers had accompanied the child to the vaccination camps. (e.g. posted of father from Dhumerguri Pt. III village in Bongaigaon district accompanying his child to the vaccination camp). In Lormagourhati Village of Kamrup (Rural) district a facilitator mentioned how encouraging male participation was discussed by the community in one of the community meetings while drawing up the Action Plans of SALT approach.

In an FGD conducted with grandmothers from Bongaigaon district, they endorsed vaccination. But added that there is still some section of people in their community who has not accepted the concept of vaccination yet especially because of the side effects like fever and cold.

"I never refuse vaccinating my grandchild, but there are people in our village who says that we should not go for immunization because it has side effects of health issues like fever and cold. So they avoid going to vaccination centres." (FGD Grandmothers-03, Udalguri)

In an FGD conducted with the mothers from Udalguri district, mothers reported that their mothers-in-law encouraged them to take the children for vaccination. Mothers in laws reportedly explained that there were no vaccinations during their time and since it is available now that too free of cost, they encouraged mothers to vaccinate their child regularly.

Moreover, few of the respondents accepted that they used to experience difficulty like fever after vaccination. But they are now aware of the vaccinations side effects and consider it to be normal.

"I want to add here something; a few months ago there was news in the air that a girl has died after taking the MR vaccine. And after that many families avoided taking the MR vaccine and many even did not let their child take their vaccine in school. But afterwards when everything was clarified people started bringing their child to the centre for vaccination." (FGD Mothers-09, Kamrup Rural)

D.2.4 Challenges reported by frontline workers in providing services

Adverse events post vaccination continued to be claimed as a reason for incomplete immunization but this was happening less often in the recent past according to frontline workers. "The child suffers from fever after being given some vaccines like Penta. Many people fear this and refuse to take the child for immunization. Earlier such cases were there in our village as well, but after I joined I explained the benefits of vaccination to the people and such cases no longer exist." (KII ASHA Worker-09, Bongaigaon)

The respondents across both control and intervention sites held the opinion that often when the **child is unwell** and suffers from fever, measles and other ailments it acts as a barrier in the path of achieving full immunization coverage.

The Key Informants asserted that one of the major challenges which they encounter is to get the child immunized for the vaccine at nine months of age and the DPT booster vaccine at one and a half years of age.

"Some parents are reluctant to get their child immunized for the fear of post vaccination side effects- such as fever or the child crying constantly which keeps them occupied with the child and they cannot focus on their work." (KII ASHA Supervisor-01, Bongaigaon)

Earlier, such low acceptance level of the community to vaccines created barriers in offering immunization services in the community and health workers has to constantly go around the community to explain the benefits of vaccines. The acceptance level of the community has increased, in the KIIs and FGD's it was said that no cases of low acceptance regarding vaccination can be seen at present, whilst they mentioned that earlier there were cases of vaccine hesitancy which has now been addressed after the SALT intervention.

"In earlier times, we had to go to their home 2-3 times just to convince them to come for the drive. In some households, mother-in-law would often object to the very idea of immunization. People would say we too had children. We never took them for vaccination. Why now? Those were the remarks. In some households, the daughters-in-law are aware. They bring their children for immunization. In some cases, guardians said no to vaccination. Now everyone understands. People often ask about the next date of vaccination. Most of the times, we don't even have to call them for vaccination". (KII ASHA Worker-03, Bongaigaon)

They have improved a lot as a result of these trainings. I visited a couple of SALT programmes. There I found the community participation to be very good. The women who were present in the SALT programme were very active and when they were asked about something they were very eager to share their learning. I liked this very much. (KII DPM-01, Bongaigaon)

"Yes I have noticed. Before people were reluctant for vaccinating their children but now they themselves show the eagerness to receive the vaccination. Project also helped us a lot. Village committee too" (KII ASHA Worker-01, Udalguri)

BOX 1. Challenges reported by frontline workers in providing immunization services:

- **Fear of side effects and low acceptance level**
- **Low education among mothers**
- **Unavailability of immunization cards in case of the migrant population**
- **Poor maintenance of records by some frontline workers**
- **Front line worker having to forego their incentives for partial immunization**
- **Resistance from mothers in law**
- **Workload and time management**
- **Monetary challenges**
- **Rude behavior of people**
- **Unavailability of infrastructure**
- **Time management when homes are scattered and spread out**

Besides they also mentioned about instances of **rude behaviour from the community members** while approaching them for immunization services. In one of the KIIs the respondent made the following comment:

“At times, a few people behave badly; still I have to be patient some people speak ill about me so clearing those misunderstandings also consumes time. So there are lot of hardships.”(KII ASHA Worker-07, Udalguri)

In addition, KIIs also brought forth some issues from the health systems/providers sides. For instance, **non-maintenance of records** is another challenge which the respondents referred to. They are of the opinion that some ASHAs and ANMs are not able to maintain proper records of the work they are engaged in. In one of the KIIs the respondent commented:

“The scenario in the villages I work is rather good. I haven’t faced much difficulty there. But I think a few ANMs and ASHA workers there are finding it difficult to maintain records. That is one problem I face.” (KII ASHA Supervisor-01, Bongaigaon)

Time management was another hurdle which the respondents pointed out. They said that the areas they have to look after are huge and the time they get for offering immunization services is less. This creates problems for them in offering immunization services on time. In one of the KIIs the respondent went on to say that they have to look after ten areas and they have only four Wednesdays in a month to conduct immunization camps. In case they cannot visit a village on Wednesday, they go on Thursdays and even Mondays to enquire about difficulties.

The respondents also mentioned about **monetary challenges** as a hurdle in offering immunization services in community. The respondents asserted that they do hard labour and do not get paid accordingly for the services they render. An ASHA said that if she did not go from door to door to inform about immunization dates and asked someone else to do the same on her behalf, people do not come for immunization.

One respondent also mentioned about the **unavailability of infrastructure** as a challenge in offering immunization services. She indicated that their village did not have “proper infrastructure” to organize immunization drives and they organized it under a tree.

D.2.5 Immunization and migrant population

The KIIs conducted with the health workers, provided glimpses into the varied opinion that exists among them about migrant population in their respective areas. Six ASHAs in Bongaigaon District mentioned about the existence of migrant population in their areas.

Unavailability of immunization cards in case of the migrant population was reported as a challenges. They said that the migrant population come in to the immunization camps without the cards following which it becomes difficult for the ANMs to know what vaccines the child has received, whether the child has received any vaccines or not. In such cases ASHAs indicated that they decide on the basis of the child's age and immunize them with the age appropriate vaccine.

While, another respondent referred to **Special Immunization Drives** conducted under Mission Indradhanush to ensure vaccination coverage for children of migrant population in her area of operation. A few of the respondents also mentioned that they advise the migrant population to **carry the immunization cards** whenever they go to a new place for work so that they can get their child vaccinated in any health facility in the new place where they migrate to; as this KI said:

“Most of them register their babies for immunization here and they get their immunization cards issued here. We tell them to carry their cards whenever they go to a new place for work and we advise them to go for routine immunization in any health facility in the new place. And when they come back they continue with their routine immunization here.” (KII ASHASupervisor-02, Bongaigaon)

Concern was expressed over the absence of an adequate mechanism in place in the health system to **ensure the continuity of vaccination** in the new places where migrant population moves to after completing a part of the vaccination in one place.

In one of the KIIs the respondent stated that some **families leave without prior information** and they come to know about the family's migration during their routine visit to that area. This creates problems for them as they have to maintain records of the vaccines in their register, especially the vaccine given at nine months of age and the DPT booster vaccine given at one and half years of age, failing which they have to forego the incentives they receive.

The respondents who did not have migrant population in their areas of work stated that they offer immunization services even to those children who do not reside permanently in their village and come there to visit relatives.

Appendix E In-depth interview guides for facilitation teams

E.1 District Facilitation Teams (DFTs)

Name of the Interviewer:

Date:

Name of member in the District Facilitation Team interviewed:

Name of NGO:

Name of district:

Venue of the interview:

Start time:

Questions/ topic guide

1. What procedure do you follow in identifying the intervention villages? What are the challenges? Are you using the data shared by PHFI team- was that helpful? What other sources of data were used?
2. How do you proceed once you reach the village? Which stakeholders did you interact with regarding this intervention? Did you face any resistance from any stakeholders?
3. How many SALT home visits have you monitored till date?
4. Your experience/ feedback on the SALT visits monitored. Are the Local Facilitation Teams able to conduct the SALT visits following proper procedures?
5. What challenges have you personally identified while monitoring the SALT visits? How did you help the LFT to overcome the challenges? /How have the challenges been overcome by the Local Facilitation Teams?
6. How frequently have you interacted with the Local Facilitation Teams? Points of discussion during the interactions.
7. Has any district/state official made visits to the intervention villages where SALT home visits were going on and have they provided any feedback?
8. Have you/ LFTs encountered any resistant households/ villages during the SALT visits? What steps have been taken to overcome the resistance?
9. Have you interacted with any of the champions identified while monitoring SALT visits? If yes, feedback received from the champions?
10. Were you part of any post SALT visit discussion in the villages? If yes, what sort of responses have you received from the community members?
11. Was there any meeting where you tried to identify the pattern of responses coming from households within community and across communities? Do you have any plan for conducting such meetings in future?
12. How frequently do you interact with the lead implementing agency (Constellation)? (Probe on: mode of communication and issues discussed)
13. Any additional information you would like to share with us

End time:

E.2 Local Facilitation Teams (LFTs)

Name of the Interviewer:

Date:

Name of the Facilitator:

Name of the NGO

Venue of interview:

Start Time:

Questions/ topic guide

Q1. In how many villages have you made the SALT visits and tell us about your experience till now

(Probe: Ask about the composition of local facilitation team and whether champions have been identified, if yes ask

- a. Did they accompany the facilitator to the other households (HHs) of the same village/different village? If yes ask what motivated them to accompany and if no ask the reason for it.
- b. Were all of them the champions identified during SALT visits by the facilitator?
- c. Were there any local village people not identified as champions by the facilitator or anyone from the village who wanted to accompany the facilitator for the SALT visits? If yes, ask what motivated them to join the facilitator?

If no LFTs have been made till present, ask the reason for it)

Q2. Can you tell us about the conversations that you have with the households during the SALT visits? (Check whether these conversations are on immunization, if no then probe: Were there any conversations on immunization?)

Q3. What has been the response of the community?

Q4. After the day's work, what do you do with the SALT visit charts?

Q5. What challenges have you faced during SALT visits and what did you do to overcome these challenges?

Q6. What do you do, when you have any queries during SALT visits?

Q7. How frequently do you interact with the district facilitation teams? (Probe on: mode of communication and points discussed)

Q8. Any additional information/observation you would like to share with us

End Time:

Appendix F Pre-analysis plan

F.1 Variables

Our study will assess the intervention's impact on these primary outcomes:

- Full immunization coverage in children 12-23 months old
- DPT3/Penta3 coverage in 6-23 month old children
- Dropout rates between different doses of pentavalent/DPT and OPV
- Possession of vaccination card

We present below the working definitions of these variables.

Outcome	Eligibility criteria	Definition
Card	6-23 month old children	Define as 1 if vaccination card of child was seen by the interviewer, 0 otherwise
DPT3/Penta3	6-23 month old children	Define as 1 if child aged 6-23 months received three doses of DPT/pentavalent vaccine, 0 otherwise
Fully immunized	12-23 month old children	Define as 1 if child aged 12-23 months received one dose of BCG vaccine, three doses of DPT/pentavalent vaccine, three doses of OPV, and one dose of measles vaccine, 0 otherwise
Dropout between DPT1 and DPT3	6-23 month old children who received one dose of DPT/pentavalent vaccine	Define as 1 if child aged 6-23 months who had received one dose of DPT/pentavalent vaccine, did not receive three doses of DPT/pentavalent vaccine, 0 otherwise.

In the survey, all eligible mothers will be asked about their child's vaccination status with respect to all antigens, irrespective of availability of immunization card, completeness status of card and child's age. After recording mother's recall of child's vaccination history, the interviewer will ask for the child's vaccination card to be seen. For each vaccine, the status of the child (received vaccine or not) will be derived based on maternal recall and details from the vaccination card, if available and seen.

F.2 Balancing Checks

For the covariates listed below we will report summary baseline information for the treatment and control arms. As is the case of individually randomised trials, it is not appropriate to use significance tests to check for imbalance in cluster randomised trials.

For the following covariates, we will present summaries (mean or median) to examine

- village-level balance between treatment and control arms
 - Population density
 - Child (0-6)
 - Female literacy
 - Proportion of scheduled caste/scheduled tribe

- Proportion of children who have vaccination cards
- Proportion of 12-23 month old children who are fully immunized
- Proportion of households with flush toilet
- Individual-level balance between treatment and control arms
 - Proportion of households with Muslim head of household
 - Proportion of households where head of household belongs to scheduled caste or scheduled tribe
 - Proportion of households in the lowest wealth quintile
 - Proportion of households in the highest wealth quintile
 - Proportion of mothers who never went to school
 - Proportion of mothers who are graduate or more educated
 - Proportion of children who were delivered in a health facility

F.3 Treatment Effects

F.3.1 Intent to Treat

The specification for the primary analysis is the following mixed-effects logistic regression model

$$\text{logit } P(y_{ijl} = 1) = \beta_0 + x'_{ijl}\beta + u_{ij} + \alpha T_i + S_{ij}$$

$$u_{ij} \sim N(0, \tau^2)$$

where y_{ijl} is the binary outcome of interest in l^{th} individual (6-23 month old child) in the j^{th} cluster in i^{th} arm, where $i=0,1$, $j = 1, \dots, k_i$ and $l = 1, \dots, m_{ij}$. We have $k_1 = k_2 = 120$ clusters in either arm and $m_{ij} \cong 15$ or 10 depending on the outcome of interest. u_{ij} is the village-level random effect that will help account for the lack of statistical dependence among observations within a village, and is assumed to be normally distributed with zero mean and variance τ^2 . T_i is the treatment indicator- for intent to treat analysis it is the arm the village was allocated to during randomization. x_{ijl} denotes a set of controls, some at the individual-level and others at the village-level. α denotes the average treatment effect.

We will adjust for the following village-and individual-level covariates (x_{ijl})

- District x strata combination the village belongs to
- Child's gender, birth order and their interaction
- Mother's age at marriage, educational attainment, father's educational attainment
- Household wealth quintile, caste and religion of head of household
- Place of delivery of child, receipt of antenatal care by mother when pregnant with child
- Proportion of children in village with vaccination card, average distance (or time taken to travel) between child's house and vaccination site, proportion of mothers who are illiterate, proportion of households in the lowest wealth quintile

F.3.2 Treatment on the Treated

The specification remains the same as above, only the treatment indicator T_i now denotes the intervention group of the village as administered. We note that at endline we are not following participants up from baseline, as with most trials. Rather, we are conducting cross-sectional surveys at the two time points with mothers of 6-23 month old children as the participants. It therefore makes no sense to keep tab of which survey participants at baseline actually received the intervention.

F.3.3 Heterogeneous Effects

Subgroup analysis is the most common analytic approach for examining heterogeneity of treatment effect. Selection of subgroups should be based on mechanism and plausibility, taking into account prior knowledge of treatment effect modifiers. The goal of this study is to evaluate the impact of the SALT (Stimulate, Appreciate, Learn, and Transfer) approach of community engagement to increase immunization coverage in Assam, a north-eastern state of India. To that end we have elected 3 districts from Assam- Kamrup rural, Bongaigaon, and Udalguri. Districts were selected using stratified random sampling in such a way that they represent Assam with respect to vaccination coverage-related outcomes and their socio-demographic correlates. It is possible to observe impact heterogeneity across districts. As a secondary assessment, exploratory in nature, we will compare across districts to see if the impact is different across districts.

The specification for ITT analysis is

$$\text{logit } P(y_{ijl} = 1) = \beta_0 + x'_{ijl}\beta + u_{ij} + \alpha_{D_{ij}}T_iXD_{ij}$$

$$u_{ij} \sim N(0, \tau^2)$$

where T_i is the treatment indicator per randomization, D_{ij} represents the district the j th village in the i th arm belongs to, and $\alpha_{D_{ij}}$ denotes the treatment effect for the district D_{ij} . The controls, x_{ijl} , are as before.

Appendix G Additional results

Table 22: Background characteristics of 12-23 month old children in the endline survey by intervention arms

Characteristics	Intervention (N=985)	Control (N=966)	Total (N=1951)
Child			
District			
Bongaigaon	318 (50)	321 (50)	639 (33)
Kamrup Rural	319 (52)	298 (48)	617 (32)
Udalguri	348 (50)	347 (50)	695 (36)
Sex			
Boy	506 (51)	487 (49)	993 (51)
Girl	479 (50)	479 (50)	958 (49)
Birth order			()
First	528 (49)	554 (51)	1082 (55)
Second	322 (53)	286 (47)	608 (31)
Third or more	131 (51)	125 (49)	256 (13)
Missing	4 (80)	1 (20)	5 (0)
Born in a health facility			()
No	86 (51)	82 (49)	168 (9)
Yes	895 (50)	883 (50)	1778 (91)
Missing	4 (80)	1 (20)	5 (0)
Has vaccination card			
No	37 (47)	41 (53)	78 (4)
Yes	948 (51)	925 (49)	1873 (96)
Mother			
Age in years			
Less than 20	56 (54)	47 (46)	103 (5)
20-24	364 (48)	388 (52)	752 (39)
25-34	507 (51)	487 (49)	994 (51)
35-plus	58 (57)	44 (43)	102 (5)
Age at marriage			
Less than 18	274 (52)	257 (48)	531 (27)
18-24	598 (49)	618 (51)	1216 (62)
25 or more	113 (55)	91 (45)	204 (10)
Education			
No schooling	100 (56)	78 (44)	178 (9)
Some primary	228 (57)	173 (43)	401 (21)
Some secondary	501 (48)	548 (52)	1049 (54)
More than secondary	156 (48)	167 (52)	323 (17)
Received full antenatal care during pregnancy			
No	531 (49)	561 (51)	1092 (56)
Yes	450 (53)	404 (47)	854 (44)
Missing	4 (80)	1 (20)	5 (0)
Spouse's education			
No schooling	112 (58)	81 (42)	193 (10)
Some primary	232 (50)	234 (50)	466 (24)
Some secondary	468 (50)	465 (50)	933 (48)
More than secondary	173 (48)	186 (52)	359 (18)
Household			
Household head's caste			
Scheduled caste	76 (63)	45 (37)	121 (6)

Scheduled tribe	234 (48)	253 (52)	487 (25)
Other backward class	260 (47)	289 (53)	549 (28)
General/Don't know	415 (52)	379 (48)	794 (41)
Household head's religion			
Hindu	663 (50)	650 (50)	1313 (67)
Muslim	271 (50)	269 (50)	540 (28)
Other	51 (52)	47 (48)	98 (5)
Household wealth quintile			
Poorest	211 (54)	181 (46)	392 (20)
Poorer	190 (51)	185 (49)	375 (19)
Middle	202 (52)	188 (48)	390 (20)
Richer	192 (50)	193 (50)	385 (20)
Richest	190 (46)	219 (54)	409 (21)

Note: Data are number of children (%).

Table 23: Background characteristics of 6-23 month old children in the baseline survey by intervention arms

Characteristics	Intervention (N=1447)	Control (N=1482)	Total (N=2929)
Child			
District			
Bongaigaon	471 (16%)	475 (16%)	946 (32%)
Kamrup Rural	494 (17%)	496 (17%)	990 (34%)
Udalguri	482 (16%)	511 (17%)	993 (34%)
Sex			
Boy	731 (25%)	763 (26%)	1494 (51%)
Girl	716 (24%)	719 (25%)	1435 (49%)
Age in months			
6-11	568 (19%)	586 (20%)	1154 (39%)
12-23	879 (30%)	896 (31%)	1775 (61%)
Birth order			
First	766 (26%)	769 (26%)	1535 (52%)
Second	492 (17%)	475 (16%)	967 (33%)
Third or more	186 (6%)	235 (8%)	421 (14%)
Missing	3 (0%)	3 (0%)	6 (0%)
Born in a health facility			
No	164 (6%)	220 (8%)	384 (13%)
Yes	1280 (44%)	1259 (43%)	2539 (87%)
Missing	3 (0%)	3 (0%)	6 (0%)
Has vaccination card			
No	31 (4%)	24 (4%)	55 (8%)
Yes	1416 (45%)	1458 (46%)	2874 (92%)
Mother			
Age in years			
Less than 20	80 (3%)	69 (2%)	149 (5%)
20-24	502 (17%)	511 (17%)	1013 (35%)
25-34	773 (26%)	792 (27%)	1565 (53%)
35-plus	92 (3%)	110 (4%)	202 (7%)
Age at marriage			
Less than 18	298 (10%)	283 (10%)	581 (20%)
18-24	962 (33%)	1026 (35%)	1988 (68%)
25 or more	187 (6%)	173 (6%)	360 (12%)
Education			

No schooling	175 (6%)	201 (7%)	376 (13%)
Some primary	303 (10%)	369 (13%)	672 (23%)
Some secondary	773 (26%)	724 (25%)	1497 (51%)
More than secondary	196 (7%)	188 (6%)	384 (13%)
Received full antenatal care during pregnancy			
No	827 (28%)	850 (29%)	1677 (57%)
Yes	617 (21%)	629 (21%)	1246 (43%)
Missing	3 (0%)	3 (0%)	6 (0%)
Spouse's education			
No schooling	157 (5%)	164 (6%)	321 (11%)
Some primary	298 (10%)	317 (11%)	615 (21%)
Some secondary	753 (26%)	734 (25%)	1487 (51%)
More than secondary	239 (8%)	267 (9%)	506 (17%)
Household			
Household head's caste			
Scheduled caste	106 (22%)	96 (19%)	202 (40%)
Scheduled tribe	398 (11%)	378 (16%)	776 (26%)
Other backward class	311 (4%)	454 (3%)	765 (7%)
General/Don't know	632 (14%)	554 (13%)	1186 (26%)
Household head's religion			
Hindu	958 (33%)	1019 (35%)	1977 (67%)
Muslim	431 (15%)	393 (13%)	824 (28%)
Other	58 (2%)	70 (2%)	128 (4%)
Household wealth quintile			
Poorest	259 (9%)	321 (11%)	580 (20%)
Poorer	284 (10%)	304 (10%)	588 (20%)
Middle	290 (10%)	285 (10%)	575 (20%)
Richer	328 (11%)	271 (9%)	599 (20%)
Richest	286 (10%)	301 (10%)	587 (20%)
Village (cluster)			
<i>N</i> ^a	97	99	196
Percentage of households in poorest wealth quintile ^a , Median (IQR)	9% (27%)	20% (27%)	13% (27%)
Percentage of mothers who cannot read and/or write ^a , Median (IQR)	13% (20%)	13% (20%)	13% (20%)
Percentage of households with Muslim head of household ^a , Median (IQR)	0% (67%)	0% (50%)	0% (67%)
Percentage of households with the head of household belonging to a scheduled tribe ^a , Median (IQR)	0% (53%)	7% (47%)	6% (47%)
Average time to vaccination site (in minutes) ^a , Median (IQR)	20 (11)	18 (10)	19 (11)

Note: Data are *N* (%) unless indicated otherwise. *N* indicates number of children expect for variables measured at the village level (as indicated by ^a).

Table 24: Characteristics of participants in villages that were excluded compared to villages that were included, at baseline and endline

Characteristics	Baseline		Endline	
	Dropped villages	Intervention and control villages	Dropped villages	Control villages
Child				
District				
Bongaigaon	236 (36)	946 (32)	240 (38)	475 (32)
Kamrup Rural	211 (32)	990 (34)	190 (30)	485 (33)
Udalguri	210 (32)	993 (34)	210 (33)	518 (35)
Sex				
Boy	335 (51)	1494 (51)	317 (50)	744 (50)
Girl	322 (49)	1435 (49)	323 (50)	734 (50)
Age in months				
6-11	245 (37)	1154 (39)	211 (33)	512 (35)
12-23	412 (63)	1775 (61)	429 (67)	966 (65)
Birth order				
First	330 (50)	1535 (52)	332 (52)	823 (56)
Second	221 (34)	967 (33)	223 (35)	473 (32)
Third or more	105 (16)	421 (14)	85 (13)	180 (12)
Missing	1 (0)	6 (0)	0 (0)	2 (0)
Born in a health facility				
No	105 (16)	384 (13)	79 (12)	126 (9)
Yes	551 (84)	2539 (87)	561 (88)	1350 (91)
Missing	1 (0)	6 (0)	0 (0)	2 (0)
Has vaccination card				
No	10 (2)	55 (2)	11 (2)	54 (4)
Yes	647 (98)	2874 (98)	629 (98)	1424 (96)
Mother				
Age in years				
Less than 20	28 (4)	149 (5)	30 (5)	76 (5)
20-24	245 (37)	1013 (35)	265 (41)	605 (41)
25-34	347 (53)	1565 (53)	303 (47)	732 (50)
35-plus	37 (6)	202 (7)	42 (7)	65 (4)
Age at marriage				
Less than 18	135 (21)	581 (20)	198 (31)	377 (26)
18-24	462 (70)	1988 (68)	374 (58)	964 (65)
25 or more	60 (9)	360 (12)	68 (11)	137 (9)
Education				
No schooling	98 (15)	376 (13)	61 (10)	121 (8)
Some primary	147 (22)	672 (23)	122 (19)	279 (19)
Some secondary	343 (52)	1497 (51)	361 (56)	821 (56)
More than secondary	69 (11)	384 (13)	96 (15)	257 (17)
Received full antenatal care during pregnancy				
No	413 (63)	1677 (57)	339 (53)	838 (57)
Yes	243 (37)	1246 (43)	301 (47)	638 (43)
Missing	1 (0)	6 (0)	0 (0)	2 (0)
Spouse's education				
No schooling	98 (15)	321 (11)	69 (11)	118 (8)
Some primary	136 (21)	615 (21)	164 (26)	352 (24)

Some secondary	339 (52)	1487 (51)	310 (48)	730 (49)
More than secondary	84 (13)	506 (17)	97 (15)	278 (19)
Household				
Household head's caste				
Scheduled caste	35 (5)	202 (7)	66 (10)	82 (6)
Scheduled tribe	164 (25)	776 (26)	144 (22)	385 (26)
Other backward class	166 (25)	765 (26)	160 (25)	422 (29)
General/Don't know	292 (44)	1186 (40)	270 (42)	589 (40)
Household head's religion				
Hindu	392 (60)	1977 (67)	424 (66)	981 (66)
Muslim	241 (37)	824 (28)	201 (31)	417 (28)
Other	24 (4)	128 (4)	15 (2)	80 (5)
Household wealth quintile				
Poorest	151 (23)	562 (19)	128 (20)	277 (19)
Poorer	145 (22)	572 (20)	130 (20)	304 (21)
Middle	129 (20)	576 (20)	146 (23)	282 (19)
Richer	127 (19)	605 (21)	120 (19)	296 (20)
Richest	105 (16)	614 (21)	116 (18)	319 (22)
Village (cluster)				
<i>N</i> ^a	44	196	43	99
Percentage of households in poorest wealth quintile ^a , Median (IQR)	20% (27%)	13% (27%)	20% (20%)	13% (20%)
Percentage of mothers who cannot read and/or write ^a , Median (IQR)	20% (20%)	13% (20%)	13% (17%)	7% (20%)
Percentage of households with Muslim head of household ^a , Median (IQR)	6% (95%)	0% (67%)	0% (90%)	0% (70%)
Percentage of households with the head of household belonging to a scheduled tribe ^a , Median (IQR)	7% (40%)	6% (47%)	7% (35%)	0% (54%)
Average time to vaccination site (in minutes) ^a , Median (IQR)	19 (10)	19 (11)	20 (12)	20 (12)

Data are *N* (%) unless indicated otherwise. *N* indicates number of children expect for variables measured at the village level (as indicated by ^a).

Table 25: Analysis of primary immunization outcomes after including the villages that were excluded

Outcome	Intervention villages N (%)	Control villages & dropped villages N (%)	Total N (%)	Unadjusted ^a		
				N	Odds ratio (95% CI)	P value
Full immunization (12-23 month old child)						
Baseline						
No	211 (24%)	304 (23%)	515 (24%)			
Yes	660 (75%)	992 (76%)	1652 (75%)			
Missing	8 (1%)	5 (0%)	13 (1%)			
Endline						
No	230 (23%)	306 (22%)	536(23%)	2377	0.92 (0.69, 1.23)	0.57
Yes	753 (76%)	1088 (78%)	1841 (77%)			
Missing	2 (0%)	1 (0%)	3 (0%)			
Three doses of DPT (6-23 month old child)						
Baseline						
No	267 (18%)	371 (17%)	638 (18%)			
Yes	1174(81%)	1744 (82%)	2918 (82%)			
Missing	6 (0%)	9 (0%)	15 (0%)			
Endline						
No	253 (18%)	341 (16%)	594 (17%)	3541	0.90 (0.67, 1.20)	0.47
Yes	1173 (82%)	1774 (84%)	2947 (83%)			
Missing	3 (0%)	3 (0%)	6 (0%)			

Table 26: Effect of intervention on change in primary and secondary outcomes from baseline: difference-in-difference analysis

Outcome	Unadjusted ^α			Adjusted ^β		
	N	Odds ratio	P value	N ^γ	Odds ratio	P value
Full immunization (12-23 month old child)	3712	1.04 (0.76, 1.44)	0.79	3703	1.11 (0.80, 1.55)	0.53
Three doses of DPT (6-23 month old child)	5818	1.02 (0.77, 1.35)	0.89	5805	1.09 (0.82, 1.45)	0.56
Dropout between DPT doses 1 and 3	5741	0.92 (0.69, 1.23)	0.58	5729	0.87 (0.64, 1.20)	0.34
Vaccination card available to be seen by enumerator	5836	0.79 (0.56, 1.11)	0.17	5823	0.75 (0.53, 1.07)	0.11
Mother has seen/heard/read any immunization messages in the last 6 months	5836	0.93 (0.74, 1.16)	0.51	5823	0.97 (0.77, 1.21)	0.76
Mother believes that community has a role to play in improving the health of her child and that community is capable of taking actions to prevent her child from getting sick	5836	0.94 (0.73, 1.22)	0.65	5823	0.98 (0.75, 1.29)	0.90
Household attends village meetings and engages in community actions to tackle village issues	5836	1.25 (1.00, 1.56)	0.05	5823	1.31 (1.03, 1.64)	0.03

^α Explanatory variables in the unadjusted model include the group assignment indicator, the survey (baseline or endline), their interaction, and the strata variable used for stratified randomization.

^β Explanatory variables in the adjusted model include, in addition to the variables in the unadjusted analysis, gender and birth order of the child, mother's age, education, spouse's education, household head's religion and caste, household wealth quintile, and village-level variables – proportion of households in the poorest wealth quintile, proportion of mothers who cannot read and/or write, and average travel time to vaccination site.

^γ Because of missing adjustment variables data, the observations used in adjusted analysis are fewer than those used in unadjusted analysis.

Appendix H Cost analysis for the intervention implementation

H.1 Introduction

In order to evaluate the impact of the SALT intervention in improving immunization coverage in rural Assam, we considered a two-arm cluster randomized trial. The treatment arm villages received SALT intervention along with the usual routine immunization services available in the villages. During the same time, the control arm villages continued to receive the routine immunization services but did not receive any additional intervention. As mentioned in the Intervention Section of the report, the SALT intervention entails facilitation of different components of the intervention in the treatment arm villages, unlike the control arm villages. The costs of implementing these components are analyzed in this section.

The Constellation, a registered NGO in Belgium, was the primary implementing organization. They took the lead in conceptualizing the intervention and provided multiple rounds of training and continued support required to implement the intervention in the community. The local NGOs, VHAA and CNES, played a key role in actually implementing the intervention in three districts of Assam.

- VHAA was responsible for Kamrup rural and Udalguri districts and
- CNES was in charge of Bongaigaon.

In the context of the impact evaluation study, the intervention continued for 13 months (March 2017-March 2018). The purpose of documenting costing information is to help planning if the intervention were to be replicated in a different context. It is to be noted that our intervention was not built into an existing health programme or system. It was implemented as a standalone intervention, although officials from the health system participated in some of the activities occasionally.

H.2 Cost Data

For the cost analysis exercise, the evaluation team consolidated data from different sources. The project budget submitted to 3ie included cost data under broad line items for Constellation and local implementing agencies. Constellation budget line item also included sub-items such as consultation fees of international and national coaches, travel cost etc. However, to get detailed data on implementation cost, we reached out to local implementation agencies. Budget from CNES and VHAA and the invoices they raised every month were used to identify costs for specific components of the intervention. In the absence of cost for a specific component for one NGO, the cost data obtained from other NGO was used and adjusted proportionally.

Following the J-PAL costing guidelines (J-PAL), we considered the following components for costing purpose.

1. **Program Administration Cost:** In this category we included consultation fees of the national and international coaches of the Constellation, the lead implementation agency. The coaches managed and coordinated the whole intervention throughout the intervention phase. It also includes cost of time of project heads and district coordinators from the local implementation agencies VHAA and CNES, and overhead costs.

2. **Staff Training Cost:** This category includes cost incurred to organize training, learning events, introductory workshop etc. The Constellation took the lead in providing relevant trainings with the help of the local implementation agencies.
3. **User Training:** It includes any costs incurred to train participants or beneficiaries. For the SALT intervention, we did not incur any such cost.
4. **Implementation:** Salary of facilitators who were hired specifically for implementing the SALT intervention in the villages for this impact evaluation study, cost of stationaries and equipment, and cost of knowledge fair where participants share their experience and learn from each other (including the cost of organizing partner meetings, stakeholder engagement and dissemination meetings).
5. **User Costs:** It includes any costs incurred by program participants, such as the cost of items users were required to purchase and the opportunity cost of participants' time. For the SALT intervention, we did not incur any cost for items that users needed to purchase for the intervention. However, since the intervention relies heavily on community engagement to successfully increase children's immunization rate, it is crucial to cost-out the opportunity cost of wages forgone, resulting from community member's time spent volunteering with the program. This encompasses community member's time during home visits, participation in community meetings, and other actions of community members that required time inputs.
Unfortunately, we do not have data on the opportunity cost. We do not intend to present cost analysis from the social cost perspective, rather from the cost to the donor perspective. If opportunity costs were counted, they might contribute substantially to the total cost of the program because a lot of community inputs (meeting time, organizing meetings and other initiatives in the community) are used and expected in the SALT program, given the high level of community engagement nature of the intervention.
6. **Monitoring:** This includes travel cost of district coordinators/ project managers from the local implementation agencies, the Constellation national and international coaches for training and monitoring purpose. However, this does not include costs for monitoring and evaluation done by the evaluation team.
7. **Targeting Cost:** The intervention did not specifically target marginalized population.
8. **Averted cost:** We did not avert any costs as a result of the intervention.

Table 27 Cost for implementing SALT intervention in 90 villages spread over three districts of Assam during the period March 2017-March 2018

Sl. No.	Cost component	Unit cost (in INR)	Quantities	Total cost (in INR)	Total	Component-wise cost	
						Total in \$	%
1	Program Administration Cost						
	Constellation						
	International coaches professional fees*			5,61,275		8635.0	
	National coaches fees			5,61,500		8638.5	
	CNES & VHAA						
	Monthly salary of district coordinators	25,000	3	9,75,000		15000.0	
	Monthly administrative cost (overhead)	5,000	2	1,30,000	22,27,775	2000.0	34%
2	Staff Training Cost						
	CNES			70,000		1077.0	
	VHAA			1,45,000	2,15,000	2230.8	3%
3	User Training	NA				-	
4	Implementation						
	Salary of SALT facilitators	10,000	9	11,70,000		18000.0	
	Travel allowance of SALT facilitators	250	234	7,60,500		11700.0	
	Stationaries	1,000	3	39,000		600.0	
	Equipment (Computer, printer at local implementation agency offices)	1,50,000	2	3,00,000		4615.4	
	Cost of VHAA and CNES for organizing knowledge fair and other stakeholder engagement meetings	2,00,000	2	4,00,000	26,69,500	6153.8	41%
5	User Costs	NA				-	
6	Monitoring					-	
	Travel allowance of district coordinators for field visit	400	60	3,12,000		4800.0	
	Travel cost of Constellation international coaches			5,61,275		8635.0	
	Travel cost of Constellation national coaches and resources from other SALT projects			5,61,500	14,34,775	8638.5	22%
7	Targeting Cost	NA				-	
8	Averted cost	NA				-	
	Total (INR)			65,47,050	65,47,050		100%
	Total (USD)*			\$100,724	\$100,724	100,724	100%

* The conversion rate of 1 USD = 65 INR, prevalent during the project period was assumed.

H.3 Cost Analysis

We considered a basic cost analysis approach which includes only financial cost of the intervention. It does not include opportunity cost of wages possibly forgone by the community members and the champions for participating in different phases of the intervention. Moreover, we did not calculate the value of time inputs of community block officers, SHGs, health workers, and religious leaders who participated in community meetings throughout the intervention phase.

In Table 28, we present different dimensions of intervention reach and calculate cost per unit for two key dimensions of intervention reach. It includes intervention implementation cost per village and cost per visits to a village under two different scenarios: 1) the usual process of implementation of the intervention as followed in our study and 2) a feasible replication scenario where the lead implementing agency Constellation may no longer needs to be involved and does not have to provide training to the NGOs as they already had trained the local NGOs to implement the SALT process. Naturally, in scenario 2, the cost per village is lower (Rs. 57,880/, \$890) than that of the usual scenario (Rs. 72,745/, \$1119) as the NGOs now are trained in SALT and can implement the program in the absence of inputs from the Constellation, if the SALT intervention were to be replicated in another district in Assam. Note that the scenario 2 includes travel cost of Constellation national and international coaches for the purpose of monitoring the intervention and providing much needed minimum support to the local NGOs. The estimates of cost per unit of intervention reach might be useful for scaling up of the intervention. Although the total cost for scaling up may not be linearly proportional to the desired level of reach of the intervention as some costs may remain the same irrespective of the level of reach. Nevertheless, the estimates would provide some insights to the policymakers.

Table 28 Different dimensions of reach of the intervention as measured during the study period March 2017- March 2018 in three districts of Assam and cost per unit of reach under two implementation scenarios

Different dimensions of reach of the intervention	Measurement of reach	Implementing the intervention following the usual process as in our study		Implementing the intervention in a feasible replication scenario	
		Total cost*	Cost per unit of reach*	Total cost*	Cost per unit of reach*
Number of villages covered during the intervention	90	₹65,47,050	₹72,745	₹52,09,275	₹57,880
		\$100,724	\$1,119	\$80,143	\$890
Total number of visits made to all 90 villages	1,560	₹65,47,050	₹4,197	₹52,09,275	₹3,339
		\$100,724	\$65	\$80,143	\$51

* The conversion rate of 1 USD = 65 INR, prevalent during the project period was assumed.

We would like to emphasize that the calculation of cost is approximate and reflects the prevailing rates at the study sites and during the study period. No depreciation, inflation and currency adjustments were performed on the cost data.

Appendix I. Checklists for onsite process monitoring

I.1. Checklist for monitoring SALT home visits

On-site Monitoring Checklist for SALT Home visits by Evaluation team				
District		Date of monitoring		
Village		Sub district		
Name of the monitor		Name of Facilitator:		
Sl. No.	Description/Indicator	Means of Verification	Response Yes /No	Remarks
1.	Is the facilitator conducting SALT visit in the village as per field plan?	Ask and check		
2	Is the facilitator carrying charts and coloured sketch pens for documenting the SALT visits?	Ask and observe		
3	Has the facilitator introduced himself/herself and explained the purpose of his/her visit.	Observe		
	Has the facilitator taken consent from the family members to talk to them	Observe		
4	Is the facilitator following the SALT steps? -Discussing their life in the community, their hopes, their concerns, ways of fulfilling their hopes, dreams particularly focusing on their children	Observe		
	-Involving as many family members as possible	Observe		
5	Is the facilitator stimulating discussion on being healthy, child health and immunization?	Observe		
6	Is the facilitator summarizing the discussion along with the family members?	Observe		
7	Is the facilitator documenting (SALT visit chart) the discussion?	Observe		
	Whether family members are also involved in the activity?	Observe		
8	Is the facilitator showing/ reading the contents of the SALT visit chart to the family for verification and necessary corrections as well as additions if required?	Observe		
9	Is the facilitator inviting the family members to be part of the post SALT visit community meeting to be	Observe		

	held after the SALT visits in the village?			
10	Is the facilitator conducting the SALT visit community meeting after the SALT visits in the village?	Observe		
11	Observations of the post SALT visit community meeting			
12	Any additional observations			

I.2. Checklist for monitoring dream building

Dream Building Monitoring Checklist (On-site Monitoring) by Evaluation team					
Name of village _____		Date of monitoring			Start time:
District.....					End time:
No of Facilitators present:		Name of monitor:			
Sl. No.	Description/Indicator	Means of Verification	Response		Remarks
			Yes	No	
1.	Is the facilitator able to mobilize the community? The composition of the group that has gathered (men, women, youth, elderly), are they representative? Presence of a prominent person like: gaon bura, religious leaders, health workers or any other	Observe			
2	Have the same people/are majority of the people that have gathered those where the facilitator has made home visits?	Ask and Observe			
3	Is the facilitator carrying charts of the SALT home visits?	Observe			
4	Has the facilitator introduced himself/herself and explained the purpose of his/her visit? For a new set of people, are they able to explain the CLCP process and link it with the SALT home visits and explain dream building?	Observe			
5	Has the facilitator carried enough blank charts and color pens?	Observe			
6	Has the facilitator formed small groups of people? If yes, how many and write composition of the groups in remarks?	Observe			
7	Is the facilitator stimulating discussions pertaining to immunization by asking the dream for health of children in 10 years?	Observe			
8	Has the community formed their common dream?	Ask and Observe			
9	Is immunization part of the common dream?	Observe			

10	Involvement of champions/community members: -in community mobilization -in facilitation of dream building -in documentation of dream building -in the process of AER	Ask and Observe			
11	Involvement of ASHA/any health worker or official -in community mobilization -in facilitation of dream building in the process of AER	Ask and Observe			
12	Is the facilitator conducting AER after dream building? Has he/she invited the champions/or health workers to join in the AER process?	Ask and Observe			
13	Any additional observations or comments				

I.3. Checklist for monitoring Self-Assessment

Self-assessment Monitoring Checklist (On-site Monitoring) by Evaluation team					
Facilitators Checklist for Self-assessment process				Start time	
Village		Date of monitoring			End time
District.....					
Number of facilitators present		Name of monitor			
Sl. No.	Description/Indicator	Means of Verification	Response		Remarks
			Yes	No	
1.	Is the facilitator carrying a few SALT home visit charts, dream building charts of the village and blank self-assessment charts with the format and a chart explaining the levels of assessment? -Is the format for self-assessment chart and levels of assessment in local language?	Check			
2	Is the facilitator able to mobilize the community? -Composition of the group that has gathered (men, women, youth, elderly) -Are they representative of the community? -Presence of community leader (Gaonbura)/ religious leader/ prominent person/ health worker of the village?	Ask and observe			
3	Are the people gathered for self-assessment same/ majority of them from SALT home visits and dream building done?	Ask and observe			

4	Has the facilitator introduced himself/herself and explained the purpose of his/her visit. -For new set of people able to explain the CLCP and link it with home visits and dream building done - showing/ reading clearly the contents of the SALT home visit charts/dream building charts	Observe			
5	Is the facilitator able to: -pick up an element from the shared dream of a healthy child and ask the community to list down practices they do presently for the dream. -able to have at least one practice related to immunization of children - Correctly document the practices which should begin with "We...followed by an active verb" -Facilitate the community to reach to a consensus for practices	Observe			
6	Is the facilitator stimulating discussions pertaining to practices for immunization and child health?	Observe			
7	Is the facilitator able to: -Explain the community the levels of assessment for assessing each practice - Facilitate the community to reach to a consensus for the levels of assessment -Correctly fill all the columns of the self-assessment framework particularly the column on 'why'	Observe			
8	Is the facilitator able to involve champions/community members during self-assessment process -Community mobilization -Facilitation/explaining CLCP -Documenting practices in self-assessment chart -In discussion on practices/ levels of assessment	Ask and Observe			
9	Has the process of self-assessment completed on the same day?	Observe			
10	Is the facilitator: -conducting After experience reflection (AER) post the process of self-assessment? -inviting members of the community/ champions to be part of the AER	Observe			
9	Involvement of ASHA/Health worker in -Community Mobilization -Facilitation -In the process of AER	Ask and observe			
12	Additional Observations of the self-assessment process				

I.4. Checklist for monitoring action plan

Action Plan Monitoring Checklist (On-site Monitoring) by Evaluation team					
Name of village_____		Date of monitoring			Start time:
District.....					End time:
No of facilitators present:		Name of Monitor			
Sl. No.	Description/Indicator	Means of Verification	Response		Remarks
			Yes	No	
1.	Is the facilitator able to mobilize the community? The composition of the group that has gathered (men, women, youth, elderly), are they representative? Presence of a prominent person like: gaon bura, religious leaders, health workers or any other	Observe			
2	Have the same people/are majority of the people that has gathered those who were present for the previous DB and SA sessions?	Ask and Observe			
3	Is the facilitator carrying chart of the common dream, self-assessment, levels of self-assessment and a few SALT home visits?	Observe			
4	Has the facilitator introduced himself/herself and explained the purpose of his/her visit. For a new set of people, are they able to explain the CLCP process and link it with the dream building and self-assessment charts -Able to explain the levels of self-assessment	Observe			
5	Has the facilitator prepared the action plan format prior to the start of the session? Is it prepared in local language?	Observe			
6	Is the facilitator stimulating discussion on practices pertaining to immunization from the Self-assessment chart?	Observe			
7	Is the facilitator able to stimulate doable actions (to be taken by the community) for the practice on immunization?	Observe			
8	Involvement of champions/community members: -in community mobilization -in facilitation of action plan -in documentation of action plan -in taking responsibilities for actions -in the process of AER	Ask and Observe			

9	Involvement of ASHA/health worker or official: -in community mobilization -in facilitation of action plan -in documentation of action plan -in taking responsibilities for actions -in the process of AER	Ask and Observe			
10	Has the indicator column (in the action plan format) been filled?	Observe			
11	If no. 9 is no, has the facilitator planned to discuss the same with the responsible person during follow-up visit?	Ask			
12	Is the facilitator incorporating their ideas while facilitating the action plan process	Observe			
13	Is the process of action plan completed, i.e. have the actions on the three practices been documented? If not, has the facilitator spoken to the community members when they will be free to gather for completing the action plan process?	Ask and Observe			
14	Is the facilitator conducting AER after action plan? Has he/she invited the champions/or people taking responsibility for the actions to join in the AER process?	Observe			
15	Has the facilitator put up the charts of common dream, self-assessment and action plan in a common community room/place?	Observe			
16	Any additional observations or comments				

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