Encouraging Full Immunization in Ethiopia through Health Worker Feedback: Baseline Report

Abstract

Despite large advances in economic growth and dramatic decreases in under-5 child mortality, Ethiopia still has low rates of full immunization. Zerihun Associates in partnership with Marie Stopes International Ethiopia (MSIE) and ideas42 has taken a different approach to increase child immunization rates in Ethiopia. To improve full immunization coverage and reduce dropouts we have created a behavioral intervention to provide feedback to health extension workers. Utilizing social proof and a salient tracking system, the "Stamp System" component makes it simple for HEWs to track dropouts and for mothers to take additional ownership of and track their child's progress and see that it is both normal and desirable to immunize their child. The intervention is being evaluated using a cluster-randomized design. The survey aimed at recording information regarding social, economic, health and immunization issues, in order to evaluate the impact of 'Community Engagement through Supportive Feedback and Non-Monetary Incentives' in Ethiopia. It covered 12 districts/woredas selected from two of Marie Stopes International's intervention zones in Oromia Region; East Shewa and Aris. The sample size totaled up to 2,700 households, selected randomly from 90 Health Posts. Baseline collection began in April 2015 and endline data collection finished in early 2018. Final results are being analyzed now. The baseline results shows that key demographic, socioeconomic and health behavior indicators are balanced between the treatment and control groups. As expected, we find low literacy rates, a high proportion of traditional dwellings, and households who are on the lower end of the wealth spectrum. We also find significant room for improvement in health behaviors, especially for immunization. While rates for immunization at birth are high, they drop off significantly and only 44% of children in treatment and control areas are vaccinated with the final vaccination, that for measles, at 9 months.

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1. Background

Despite large advances in economic growth and dramatic decreases in under-5 child mortality, Ethiopia still has low rates of full immunization. Further progress will involve identifying and tackling the bottlenecks to immunization. In particular, while there have been many attempts to involve communities in increasing immunization rates, most such efforts have focused either on increasing awareness or interest in immunization, or have employed direct (often financial) incentives to increase immunization rates. Zerihun Associates in partnership with Marie Stopes International Ethiopia (MSIE) and ideas42, a non-profit firm that uses behavioral science to improve social outcomes, will take a different approach to increase child immunization rates in Ethiopia. To improve full immunization coverage and reduce dropouts we developed multiple designs and through an iterative process have refined the design based on implementation feasibility, how well the design addresses the identified bottlenecks, and costs associated with both piloting and scale-up. In April 2015 we conducted user testing to allow us refine and finalize the design.

Underlying the use of providing more information to communities or financial incentives is the assumption that people's actions directly reflect their intentions. This belief is standard and is frequently correct. However, the field of behavioral science shows us that there are many important situations where people's actions may not line up with their intentions or desires. In particular, it is possible for a mother to be convinced of the importance of immunization without her necessarily taking the required steps to immunize her children, so that further education or awareness building may have limited effects. Additionally, a Health Extension Worker may want to and have the intention of follow-up with every child due for an immunization visit but may have limited bandwidth to figure out which children need follow-up or may get distracted by other duties. As immunization clinics are time-sensitive, ensuring all eligible children attend the clinic would increase the cost-effectiveness and efficiency of the clinics.

Research shows that *providing feedback* that enables an individual or community to benchmark her/its own performance against that of an appropriate peer group can be an effective spur to action, especially when it *primes and leverages a sense of pride in one's group identity* and is combined with *recognition for improvements and performance*. Set up appropriately, such a system can lead to a virtuous cycle, where individuals and communities strive to achieve yet higher performance on the indicators which are rewarded, albeit non-monetarily.

The theory of changes postulates that feedback will lead to additional outreach to families with children in need of immunization. This outreach will lead to parents taking their children to immunization clinics at the HP or to other centers for immunization. The improved community immunization rates will lead to non-monetary incentives for the HEW which will start a positive reinforcement cycle for the HEW, leading to improvements in self-efficacy and increased engaged

with the community. The increase in immunized children will lead to lower overall morbidity for children.

While there have been many attempts to involve communities in increasing immunization rates, most have focused either on increasing awareness or interest, or have employed direct (often financial) incentives. Underlying the use of these techniques are standard neoclassical economic assumptions that people's actions directly reflect their intentions. However, behavioral economics says these assumptions may not be valid in many important situations. In particular, it is possible for people to be convinced of the importance of immunization without their necessarily taking the necessary steps to immunize their children. If so, further education or awareness building may have limited effects.

However, behavioral economics research also points towards several currently under-utilized alternatives. *Providing feedback* that enables an individual or community to benchmark her/its own performance against that of an appropriate peer group (thus utilizing *social proof*) can spur action, especially when it *primes a sense of pride in one's group identity*, is combined with *recognition for improvements and performance, and provides clear action steps to overcome hassle factors*. Set up appropriately, such a system can lead to a virtuous cycle, where individuals strive and are equipped to achieve even higher performance.

The intervention aims to increase understand of a realm of the health care literature that is unexplored: how to engage communities by using behaviorally-informed feedback to mobilize health care workers around improving immunization rates and secondly, how to create a positive reinforcement loop for those improvements using non-monetary rewards. The intervention has two parts that work in tandem: giving HEWs the ability to easily track dropouts and a system for making follow-up of drop-outs easy while providing recognition and social proof to both the HEW and caregivers. Utilizing a planning prompt to create a moment of action, the "HEW Outreach movement" prompts HEWs to think about outreach for immunization at the right time and to perform targeted outreach to dropouts. Utilizing social proof and a salient tracking system, the "Stamp System" component makes it simple for HEWs to track dropouts and for mothers to take additional ownership of and track their child's progress and see that it is both normal and desirable to immunize their child.

Providing feedback to individuals has been shown to improve pro-social and community outcomes. In a health care context, quality of performance increased for cardiac surgeons in the US who were given new feedback on their performance compared to financial incentives (Kolstad 2013). In a resource use context, Datta et al. (2015)[1] demonstrated that providing households feedback on their own water usage and descriptive social norms of their community's water

[1] A Behavioral Approach to Water Conservation: Evidence from a Randomized Evaluation in Costa Rica, Saugato Datta, Matthew Darling, Karina Lorenzana (ideas42), Oscar Calvo Gonzalez, Juan Jose Miranda, Laura de Castro Zoratto (World Bank) April 2015

usage, reduced household water usage by 3.7-5.6 percent. Allcott (2011)[2] found similar conservation results by providing households feedback on electricity usage in the United States. In these cases, individual feedback resulted in improved community outcomes through changes in individual choices, and we are hoping to build upon the literature by investigating the effect of the interaction between providing individuals feedback while at the same time providing the community as a whole actionable and supportive feedback.

As with the literature on supportive feedback, the literature on non-monetary rewards does not include situations in which individual health care workers and communities are working together to improve a community's results. Zambia, Ashraf et al. (2014)[3] explored the effects of providing non-financial and financial incentives to individual condom sellers. They found that the sales of condoms by hairdressers who were in the treatment group that received a non-monetary rewards system of stars with a progress thermometer, plus an invitation to a recognition ceremony for the highest sellers, were double that of either the control group or the treatment groups that received monetary incentives. Ashraf's work builds upon the theoretical work of Beasley and Ghatak (2005)[4], which postulates that non-monetary incentives are most powerful for individuals who are aligned with the mission of their organization.

The feedback loop associated with non-monetary incentives will work to stimulate activities around existing responsibilities as compared to encouraging new activities for the HEWs. Immunization is one of the 16 key packages of essential health care services HEWs are required to deliver. The feedback provided to HEWs will be actionable and will be designed to ease the burden for HEWs completing their existing tasks. Thus we expect two potential outcomes for HEWs: their workload will decrease through increased efficiency around immunization tasks and they will be able to spend more time focusing on tasks not related to immunization.

This report summarizes the baseline data collected in April 2016 for the Zerihun Associates, Marie Stopes International Ethiopia, and ideas42 project to improve immunization coverage in the Oromia region of Ethiopia. It also provides evidence to support the fact that the randomization was balanced between treatment and control areas across key indicators.

[2] Social norms and energy conservation H Allcott - Journal of Public Economics, 2011

[3] No margin, no mission? A field experiment on incentives for public service delivery, Nava Ashraf, Oriana Bandiera, B. Kelsey Jack - Journal of Public Economics, 2014

[4] Competition and Incentives with Motivated Agents, Timothy Besley and Maitreesh Ghatak – The American Economic Review, 2005

2. Evaluation Methodology

Sampling Strategy and Methods

This study was built on a randomization design in order to identity intervention impact. The randomization took place at the cluster level – a cluster representing a Health Post (HP). Both the control and treatment groups will receive the standard Ethiopian Ministry of Health procedures for health promotion activities and the immunization schedule. The treatment group will additionally receive a behaviorally-informed feedback and non-monetary rewards intervention.

The intervention will occur in Arsi and East Shewa zones of the Oromia region of Ethiopia. For the evaluation, 90 Health Posts (HPs) were selected and 30 random sample of households from each HP catchment cluster were included for the household survey. In total, 2,760 households were surveyed (Figure 1). Recent Household Census of HP catchments conducted by the Health Extension Program of the Regional Government was used as a sampling frame to randomly select 30 sample households in each cluster. All household with a child or children less than 23 months, was included in the random selection of survey households. To capture the same cohort of children targeted at the baseline, our endline survey will cover all children under 4 years old in the sampled households.

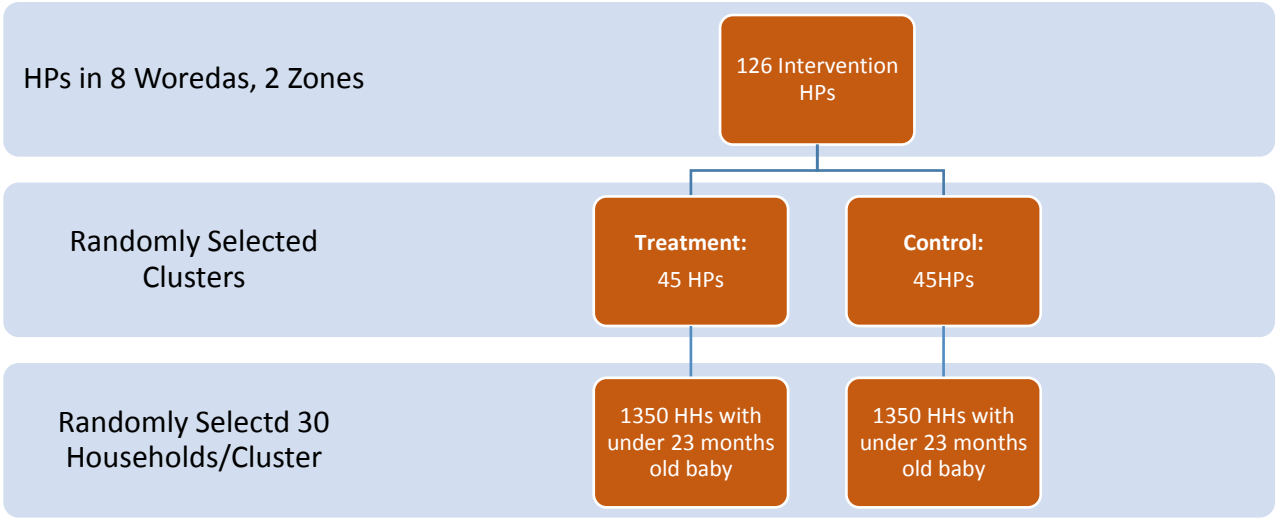


Figure 1: Sampling Strategy

The impact evaluation sample consists of 2700 households, with equal numbers (1350 households) selected into treatment group (Health Posts with HEW Outreach Movement prompts and Stamp System) and selected out of outreach movement prompts and stamp system

(control groups). The behaviorally informed interventions included in the evaluation is planned to take place in 45 health post catchment areas/clusters in Arsi and East Shewa Zones of Oromia Regional State, Ethiopia. The other 45 randomly selected health post catchment areas will remain controls for the study duration.

2.1. Project Area Selection Justification

The primary consideration in selecting Arsi and East Shewa Zones of Oromia for this pilot intervention were: 1) ensuring that the zones have large number of districts with higher dropout rates and health post catchment areas have some level of mobile phone coverages, and 2) the zones are geographically assessable to ensure our budget is enough to implement the study in large number of health posts that is necessary to rigorously evaluate the impact of the intervention. The overall selection frame will thus be based on dropout rates, feasibility and pilot operational considerations. Among the two zones 8 woredas were selected based on dropout rates (Table 1). If a woreda is selected, then all Health Centers and the Health Post attached to that health center will be automatically be eligible for the selection. Households from within these Health Posts will be randomly sampled for inclusion in the baseline and endline surveys.

Table 1: Vaccine Dropout in Study Districts

WID	Woreda Name	Zone	No Of Health Posts	Dropouts PCV%*	Dropouts Penta%*
1	Bele Gasgar	Arsi	14	11.5	11
2	Deksis	Arsi	11	19.4	21
3	Gololcha	Arsi	26	8.4	7.4
4	Zeway Dugda	Arsi	12	12.3	12.6
5	Adaa	East Shewa	21	8.4	8.3
6	Bora	East Shewa	16	14.2	14
7	Fentale	East Shewa	12	22.2	22
8	Liben	East Shewa	17	12	10.6
	Total		**129**	**13.6**	**13.4**

^DHS 2011/2; data available at Region level only

**HMIS 2014*

There are approximately 25 Health Centers that are attached to the 129 Health Posts that is an average of 5 Health Posts per health center. If a Health Center is selected as intervention cluster, then the HPs attached to that HC will automatically be selected as treatment. There are on average two HEWs in the selected 129 Health Posts.

On average pilot selected woredsa have higher dropout rates than other woredas in the region. Below (Figure 2 and 3) shows density distribution of dropout rates between the woredas selected for pilot project and other Oromia region woredas. The blue line depicts the average dropout rates distribution for selected woredas and the red line represents dropout rates distribution for the other woredas in Oromia region. On average the pilot project is targeting woredas that has higher dropout rates and at the same time operationally feasible for the project.

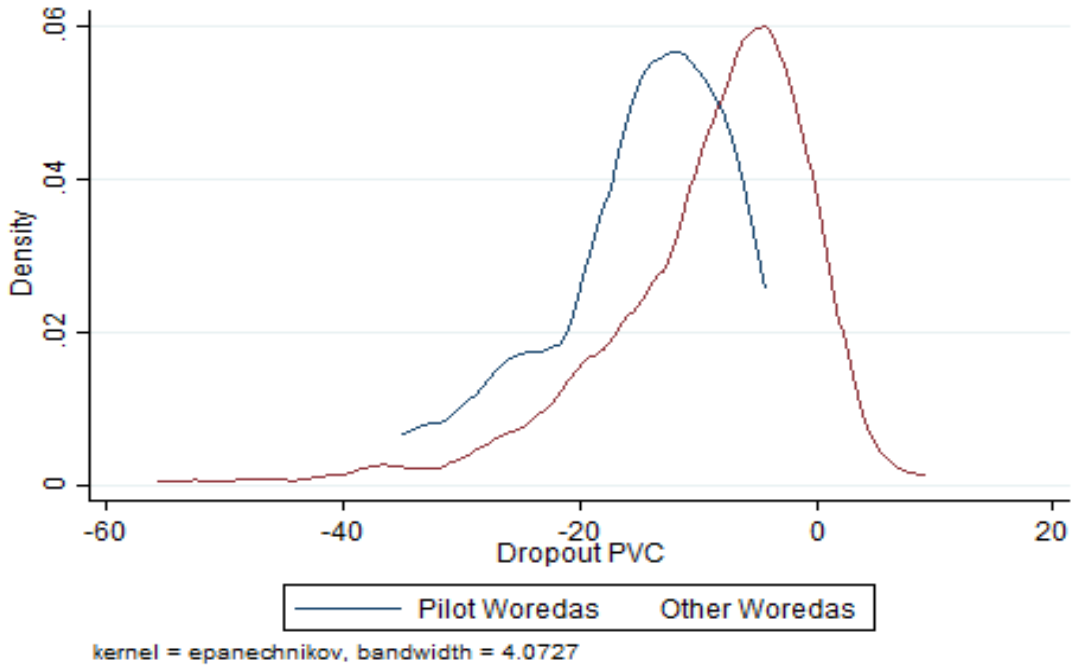


Figure 2: Density Distribution, Vaccine Dropouts among Orogmia Region Woredas by Project Selection Status (HMIS, 2014)

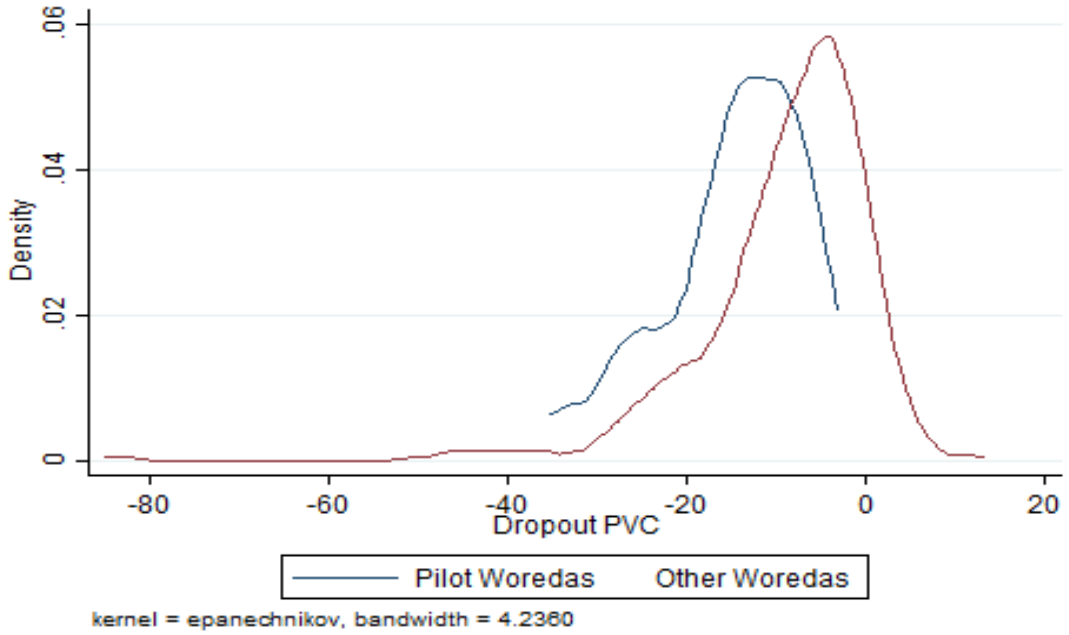


Figure 3: Density Distribution, PVC Droputs among Oromia Region Woredas by Project Selection Status (HMIS, 2014)

Power Calculation

The Oromia region in Ethiopia has low levels of immunization coverage. The 2011 Ethiopia Demographic and Health Survey (Ethiopia Central Statistics Agency, 2011) calculated the current full immunization rate for the region at 12%, thus we will use that as our baseline, as opposed to the national rate of 24% full immunization coverage. Rates for households in the lowest three wealth quintiles nationally are less than 20% (EDHS 2012). For these ample size calculations, we will assume a significance level (an alpha) of 0.05 and a power level (a beta) of 80%.

As we are employing a cluster-level design, we also need to estimate the Intracluster correlation (ICC), a measure of relatedness of clustered data, ranging in value from 0 to 1. Zero implies there is no relatedness whereas 1, a theoretical level, implies that the observations within a cluster are identical. Using the Ethiopia DHS data, we estimated the ICC to be between 0.21 and 0.25 and compared it to published values in the literature. Banerjee et al. (2010) found an ICC of 0.21 related to community immunization in India while Blanton et al. (2007) estimated the average ICC for full immunization rates from 48 nationally-representative DHS surveys around the world to be 0.21. To be consistent with the literature, we use 0.21 for our calculations, and performed a sensitivity analysis to ensure that does not significantly affect the sample size.

Power calculations were completed using 3ie sample size minimum-detectable-effect calculator (Table 2) with the parameters above. It estimated a minimum detectable effect of 8.6 percent. Thus we would expect to be able to detect an increase in full immunization rate as small as 8.6 percent and a reduction in vaccine dropout by 8.6 percent – that is for example, we expect to detect an effect in the reduction of dropout as low as from its current 13.5% (table 1) to 12.3% from 12%. Related studies in immunization detected similar of higher effect sizes. Banerjee et al. (2010) detected an impact of more than 50% in immunization with a non-monetary incentive given to households while Ryman et al. (2011) used a traditional training intervention to detect an increase of 30% in full immunization coverage in India.

Table 2: Power Calculation, Minimum Detectable Effect Determination

Parameter	Value	Definition	Source of parameter - comments
α	0.05	Significance level	interventions
β	0.8	Desired power of the test	Commonly used power level in the evaluation of public health interventions
Tail	2	One-tailed or two-tailed test	We are testing the status of dropout due to the intervention in both directions
t_1	1.96	T-value corresponding to the desired significance level of the	
t_2	0.84	T-value corresponding to the desired power of the design	
σ_y	0.3	The pooled total standard deviation of the estimated effect on the outcome variable	
ρ	0.21	Intra cluster correlation coefficien	Assumed based on average Intracluster correlation coefficient of 'child fully immunized' based on 48 past DHS surveys http://unstats.un.org/unsd/hhsurveys/pdf/Household_surveys.pdf, http://surveyconference.cred.be/documents/Conference2007/Blanton.pdf. Intracluster correlation calculation for fully immunized outcome based on Ethiopia DHS 2011 also shows similar figure. A related study by Banerjee et al. estimated an ICC close to 0.21 (0.25). Improving immunisation coverage in rural India: clustered randomized controlled evaluation of immunisation campaigns with and without incentives. Abhijit Vinayak Banerjee, Esther Duflo, Rachel Glennerster, and Dhruva Kothari. http://www.povertyactionlab.org/publication/improving-immunization-coverage-rural-india-evaluation-immunization-campaigns-and-withou
P	0.5	Proportion of individuals assigned	90 health posts will be randomly assigned into equal number of 45 health posts
R^2	0	Proportion of outcome variance explained by level 1 covariate(s)	default RCT
n	30	Number of individuals per cluster	constrained by the number of household with under 1 year old within the health post catchment cluster
J	90	Number of clusters of treatment group and control group	
δ	0.086	Minimum detectable effect	

Evaluation Analysis Plan

Measuring impacts of the intervention on full immunization coverage and dropouts are the core aspect of this evaluation. The main hypothesis is that "HEW Outreach Movement" prompts and "Stamp Systems" delivered in tandem may have positive average impacts on full immunization coverage and vaccine dropouts. We group these outcomes into two domains: full immunization coverage and vaccine dropouts. For both outcome variables we will apply standard definitions from WHO guidelines.

According to the WHO guideline[5] "complete or full immunization" coverage is defined as a child has received a BCG vaccination against tuberculosis; three doses of DPT vaccine to prevent diphtheria, pertusis, and tetanus (DPT); at least three doses of polio vaccine; and one dose of measles vaccine.

[5] WHO. WHO vaccine preventable diseases: monitoring system: 2001 global summary. Geneva: World Health Organization (WHO/V&B/01.34); 2001.

The outcome variable full immunization will have five response categories: no, vaccination date on card, reported by mothers, vaccination marked on card and DK (don't know). We will recoded each variable into 0 and 1. No - responses will be recoded as "0" and labeled "not received the vaccine", while the other responses "vaccination date on card, reported by mothers, vaccination marked on card" were recoded together as "1" and labeled "received the vaccine". Then, we added all yes - zero scores and labeled them "Immunization status". The immunization status was recoded as "0" if the child had received all the doses of vaccinations and categorized as "complete or full immunization" or "1" if the child had missed one or more doses of vaccinations and categorized as "incomplete immunization".

The outcome variable vaccination dropout rates refers to DTP1-DTP3 dropout rates and PCV1-PCV3 dropout rates. These indicators are measure as the absolute difference in percentage points between DTP1 and DTP3 or PCV1 and PCV 3 in study areas, based on the population weighted average estimates.

The study will include exposure variables such as age of mothers, mother's occupation, child death, parity, religion, women's education, husband's education, household well-being, birth order, awareness of interventions of the project, use of HEWs outreach, sources of vaccination information, received postnatal check-up within 2 months after birth, antenatal care follow up of at least 4 times, place of delivery, number of living children in the household, sex of child and marital status. Whereas place of residence, and health post catchment areas were considered for the behaviorally informed exposure variables.

For both outcome indicators, the main analysis is going to use household survey. The change in these indicators between baseline and endline will be considered as the impact of the project. A difference-in-difference approach will be adopted to measure how the project has reduced dropouts and improved full immunization. Similar analysis will be conducted to measure how the project reduced barriers to immunization services among marginalized groups such as rural women. For example, we will look at the difference in immunization improvement between children living in remote villages and towns and villages close to district towns at endline vis-à-vis at baseline. Similar analysis will be done for other dimensions of marginalization (e.g. children from poor households, mothers engaged in earning, parent/caregiver's level of education, etc.) and core immunization outcomes.

How do the outputs addressed by the project relate to core immunization outcomes of interest?

By leveraging on the RCT structure and any variation in the progresses made in intended outputs (e.g. HEWs outreach movement prompts), we will able to analyze whether progress in performance correlate with them. That is, for outcomes in which the same question is asked in

both the baseline and follow-up surveys, our main specification will be following the following specification:

$$Y_{ij,\,t=1} = \sigma + \beta T_i + \eta Y_{ij,\,t=0} + \lambda M_{ij,t=0} + \vartheta X_S + \varepsilon_{ij}$$

Here $Y_{ij,\,t=1}$ is the *given outcome variable (immunization coverage or vaccine dropouts)* by child i of village j measured post treatment, $Y_{ij,\,t=0}$ is its baseline value and $M_{ij,t=0}$ a dummy variable indicating whether or not this baseline value is missing, T_i is the treatment indicator (1 if the household was in a village in which the HEWs received the treatment, and X_s is a vector of randomization strata dummy variables (HEWs outreach prompts, recognition, child gender, location type) and ε_{ij} is the error term. β will provide the intent-to-treat effect, which is the average effect of being selected to participate in the interventions.

Not all those who are in the treatment village benefit from the interventions, and some of the control group may participate in the interventions, hence we can also estimate the following equation:

$$Y_{ij,\,t=1} = \sigma + \beta HEW_i + \eta Y_{ij,\,t=0} + \lambda M_{ij,t=0} + \vartheta X_S + \varepsilon_{ij}$$

Where HEW_i is an indicator for benefiting from the HEWs outreach prompt and the Stamp System, which is instrumented by assignment to treatment status, T_i. As a result, β measures the treated-on-the-treated, that is the impact of the intervention for those participated in the intervention when selected to participate and do not participate when selected as controls.

To estimate the heterogeneous treatment effects we will interact the treatment status and all control variables in the above two specifications with the variable of interest $Z = \Phi(T_{i*} X_S)$

$$Y_{ij,\,t=1} = \sigma + \beta T_i + \eta Y_{ij,\,t=0} + \lambda M_{ij,t=0} + \vartheta X_S + \Phi(T_{i*} X_S) + \varepsilon_{ij}$$

The third part is about leveraging the quantitative dataset to generate useful knowledge beyond the suggested impact outcome variables. This exploratory analysis has three aspects – firstly, a descriptive statistics of what the parent/caregivers consider as the barrier to immunization for children (e.g reasons for not vaccinating her child), and differences between children who are fully immunized and not immunized or dropouts at baseline in terms of household and individual child characteristics (from household survey). For variables where are there are statistical difference at baseline will be investigated deeper at the second stage of analysis. In this second tier of analysis – we will conduct bi-variate regression analysis to see whether these characteristics at baseline are associated with the change in vaccination performance. The third

level analysis will involve putting all these characteristics in single regressions to identify the ones that significant. This third analysis will show which ones are significant after controlling for the rests.

How does the project address different barriers to immunization coverage? There are several pieces of data to inform on this question. In the household survey, the caregivers' perception of changes in different dimensions on access and quality immunization services over the last eighteen months will reflect both how the project has changed those barriers and how this information has flowed to the caregivers. Secondly, all the baseline characteristics that are found to be associated with immunization coverage performance.

Procedures for Addressing Survey Attrition

Based on budget and response rates, we will employ extensive methods at the endline to address the issue of survey attrition. We will estimate if attrition is related to treatment status using the following specification:

$$A_{ij} = \sigma + \beta T_i + \vartheta X_S + \varepsilon_{ij}$$

Where A_{ij} is an indicator of whether household *i* in village *j* attrite from the study by not responding or being able to be tracked for the endline survey. X_s is a vector of randomization strata dummy variables (HEWs outreach prompts, recognition, child gender, location type). We will test $\beta=0$ to determine whether survey attrition is related to treatment status or not. If treatment status is not found to significantly affect attrition at 5% significance level, then all our estimates will proceed without any adjustment. However, if attrition is found to be related to treatment status, then we will apply Lee bounds to obtain bounds on our treatment estimates.

Data Collection Instrument and Field Work Procedures

The questionnaire was designed and tested to capture background information on the household composition, basic demographics, education, socio-economic and health status. However, the main focus was placed on information regarding health seeking behavior and immunization levels. The questionnaire was translated to Oromifa, commonly used language in the study areas. Zerihun Associates Electronic Survey Expert programmed the questionnaire using CSpro for high quality data. Enumerators were trained to improve their skills and get them acquitted with the survey tool.

Prior to the baseline survey, enumerators were given week long training on the baseline survey module. Supervisors were deployed to follow up interviews and to ensure quality of data. The field team were

provided with the lists of health post clusters and corresponding households samples. Thirty respondent were interviewed per cluster in both the control and treatment groups.

Each interview data was scrutinized by the survey supervisor and for the second time by the field manager. Zerihun Associates data process manager cleaned and prepared the data for analysis. The data was then analyzed using STATA software.

3. Baseline Results

This report summarizes the baseline data collected in April 2016 for the Zerihun Associates, Marie Stopes International Ethiopia, and ideas42 project to improve immunization coverage in the Oromia region of Ethiopia. It also provides evidence to support the fact that the randomization was balanced between treatment and control areas across key indicators.

3.1. Household Demographics

Both treatment and control areas have similar demographics, including location and household structure. 98% of households in treatment areas are considered rural and 99% of households in control areas are considered rural (Chi2=0.082). In treatment households there are 3.94 children ever born and 3.56 ever born in control, which was not statistically significant (p=0.34). There were also no significant differences in the number of women in the household in treatment (2.97) compared to control (2.98) (p=0.844) or in the number of men in the household in treatment (3.02) compared to control (3.02) (p=0.961). The number of individuals who live and eat in a household was 5.99 in treatment households and 6 in control (p=0.928).

The gender of the head of household and treatment status (Figure 4) were not independent, with 92.9% of treatment households being headed by a male and 95.0% of control households headed by a male (Chi2=0.018). Religion and treatment status were also not independent, with details of the four most common religions shown in Table 3. (Chi2<0.000).

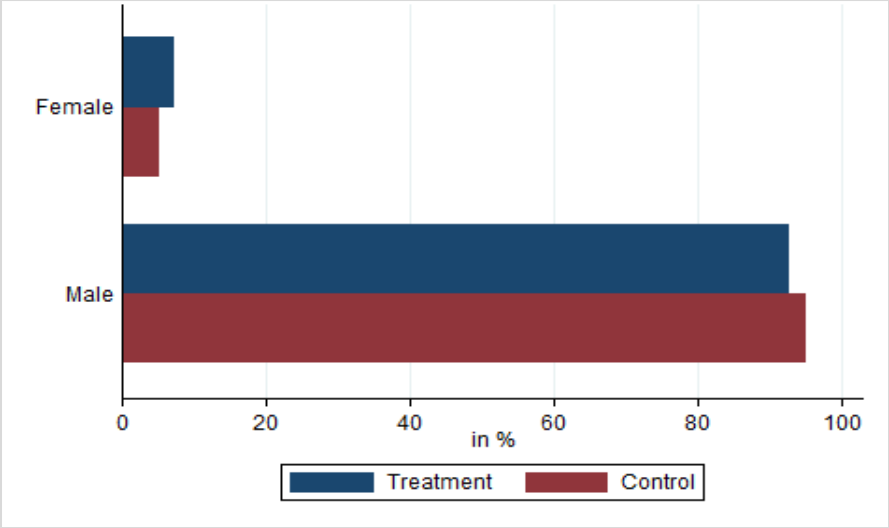


Figure 4: Sex of Household Head

Table 3: Religion by Treatment Status

Religion	Treatment	Control
Orthodox Christian	42%	52%
Catholic Christian	<1%	<1%
Protestant Christian	6%	9%
Muslim	49%	36%
Other	3%	3%

The ethnicity of the head of household was independent to treatment status, with 98% reporting as Oromia in the treatment area and 97% reporting as Oromia in the control areas (Chi2=0.184).

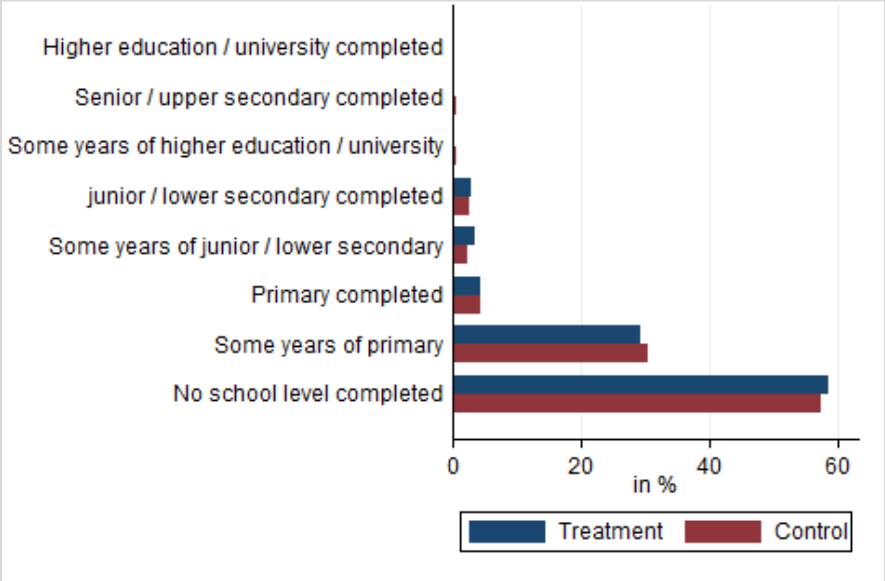


Figure 5: Highest Level of Education

The highest level of education received by the respondent (Figure 5) was independent to treatment status (Chi2=0.233). Additionally, literacy levels were independent to treatment status, with 34% of respondents in treatment households literate and 33% literate in control households (Chi2=0.703).

3.2. Household Characteristics and Socio-Economic Status

In some cases socio-economic status indicators vary between treatment and control areas but overall the sample is balanced. The household wealth index did not significantly vary (p=0.888)

between treatment (0.395) and control (0.393). However monthly expenditure on food was significantly different, with 991 Birr spent in treatment households and 1050 Birr spent in control households (p=0.025). The type of dwelling was also not independent from treatment status, shown in Table 4 (Chi2<0.000).

Table 4: Type of Dwelling by Treatment Status

Type of dwelling	Treatment	Control
Non-traditional house	27%	37%
Traditional house/hut	73%	62%
Informal structure or shack	<1%	<1%
Tent	<1%	<1%
Flat in a housing block	<1%	<1%
Single room in larger dwelling	<1%	<1%

The type of sanitation available was independent from treatment status, shown in Table 5 (Chi2=0.242).

Table 5: Access to Sanitation by Treatment Status

Sanitation available	Treatment	Control
Pit Latrine/traditional pit toilet	53%	50%
Ventilated improved pit latrine (VIP)	<1%	<1%
Flush toilet	4%	4%
No facility/Bush/Field	42%	45%
Other	<1%	0

The source of drinking water was not independent from treatment status, shown in Table 6 (Chi2<0.000).

Table 6: Drinking Source by Treatment Status

Source of water	Treatment	Control
Piped into dwelling or compound (formal)	2%	2%
Piped into dwelling or compound (rented/informal)	12%	6%
Public outdoor tap or borehole	48%	53%
Well with a cover	6%	7%
Well without a cover or rain water	7%	4%
River, lake, or pond	19%	20%
Vendor or truck	6%	6%
Other	<1%	2%

Additionally the size of the land (Figure 6) was not independent to treatment group, and more people in the treatment group had larger plots, with 60% of the treatment group having more than half a hectare compared with 54% of control. Meanwhile 13% and 12% respectively had exactly half an acre, and more control households than treatment households had less than half an acre with 34% of control households and 27% of treatment households having land in this smallest category (Chi2=0.002).

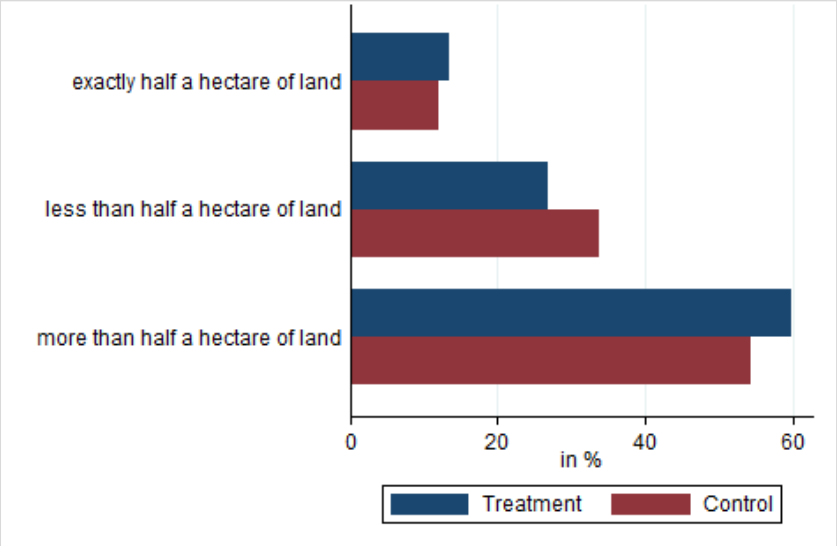


Figure 6: Size of the Land by Treatment Status

Access to electricity was independent of treatment status, with 28% of households in treatment areas having electricity available and 29% having it available in control areas (p=0.929). Despite the fact that food expenditures, plot sizes, and hunger were not independent of treatment status, the household's own perceptions of their socioeconomic status (Figure 4) were independent of treatment status (Chi2=0.274).

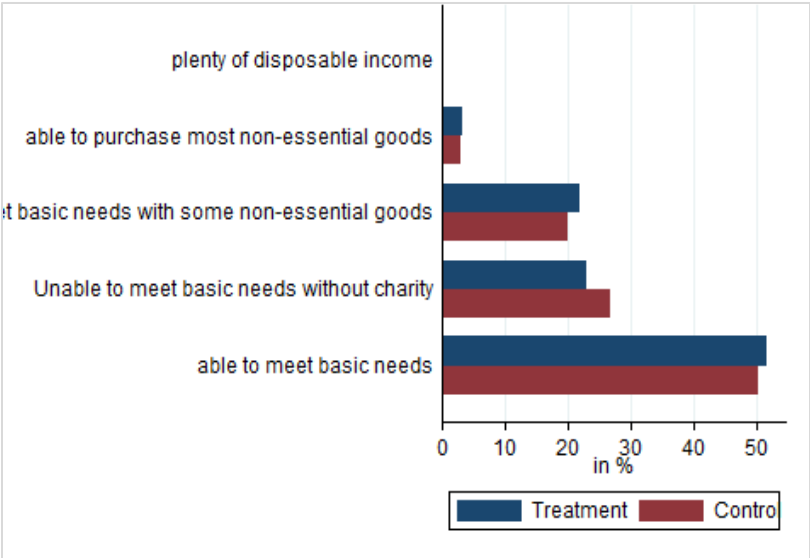


Figure 7: Household Income Situation by Treatment Status

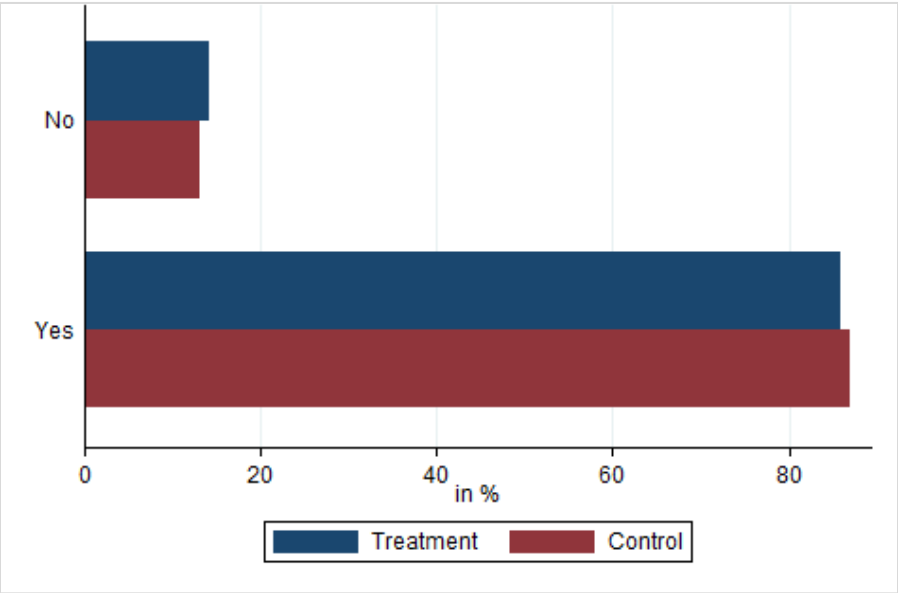
Another key socio-economic indicator is how many days a household went to sleep hungry in the previous 12 months (Table 7), which was also not independent of treatment status (p=0.004).

Table 7: Food Security by Treatment Status

Days went to sleep hungry	Treatment	Control
Never	62%	57%
1-2 days	29%	29%
3-10 days	9%	13%
Most days/Always	<1%	<1%

3.3. Health Seeking Behavior

Health behavior, especially behavior related to child immunizations, was similar in both groups.



Investigating if a child received immunizations at birth, 14 weeks and 9 months, all are independent of treatment status. For vaccinations at birth (Figure 8), 86% of children in treatment areas and 87% of children in control areas were vaccinated (Chi2=0.448).

Figure 8: Vaccines at Birth by Treatment Status

For vaccinations at 14 weeks (Figure 9), 70% of children in treatment areas and 71% of children in control areas were vaccinated (Chi2=0.627). For the 9-month measles vaccination (Figure 10), we see that 44% of children in both treatment and control areas were vaccinated (Chi2=0.990).

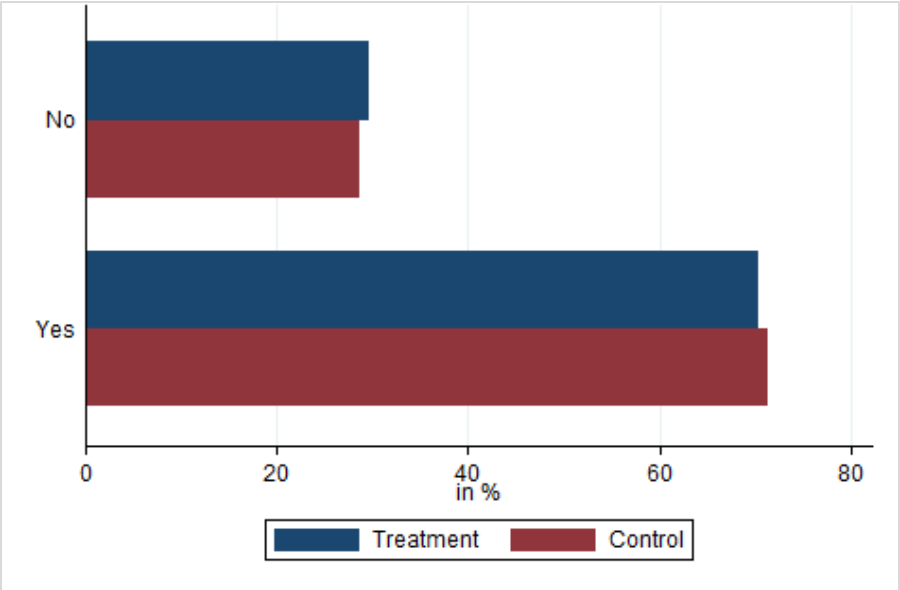


Figure 9: Vaccines at 14 Weeks

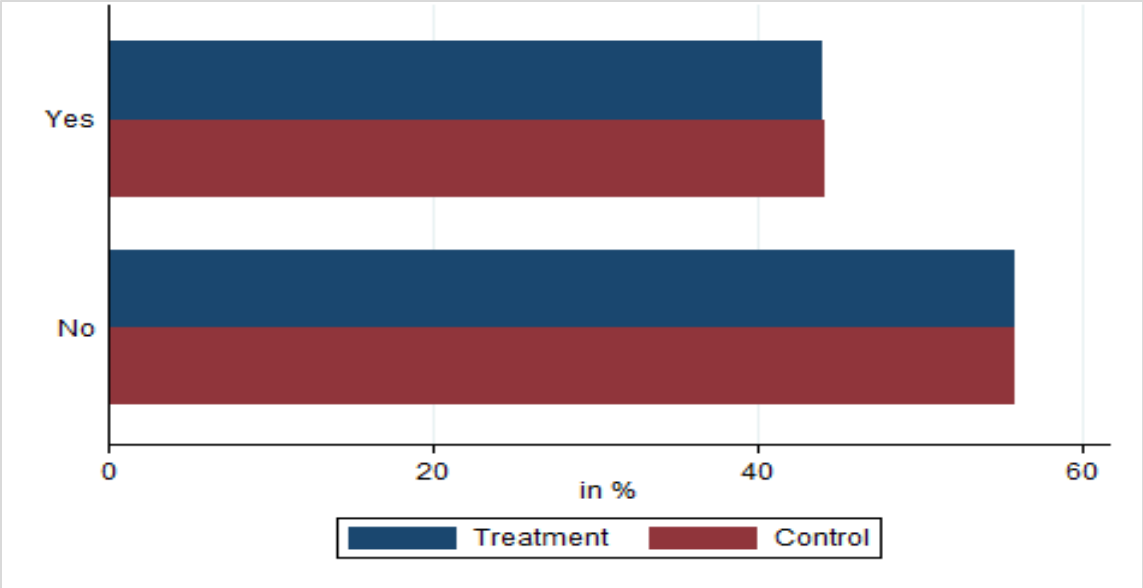


Figure 10: Vaccines at 9 Months by Treatment Status

Seeking treatment for illness was also independent of randomization treatment status, with 40% of households in treatment areas seeking treatment and 43% in control areas (Chi2=0.098). When we examine the behavior of the majority of households that did not seek treatment and instead self-treated their illness (Figure 11), we find that it is also independent of randomization treatment status (Chi2=0.419).

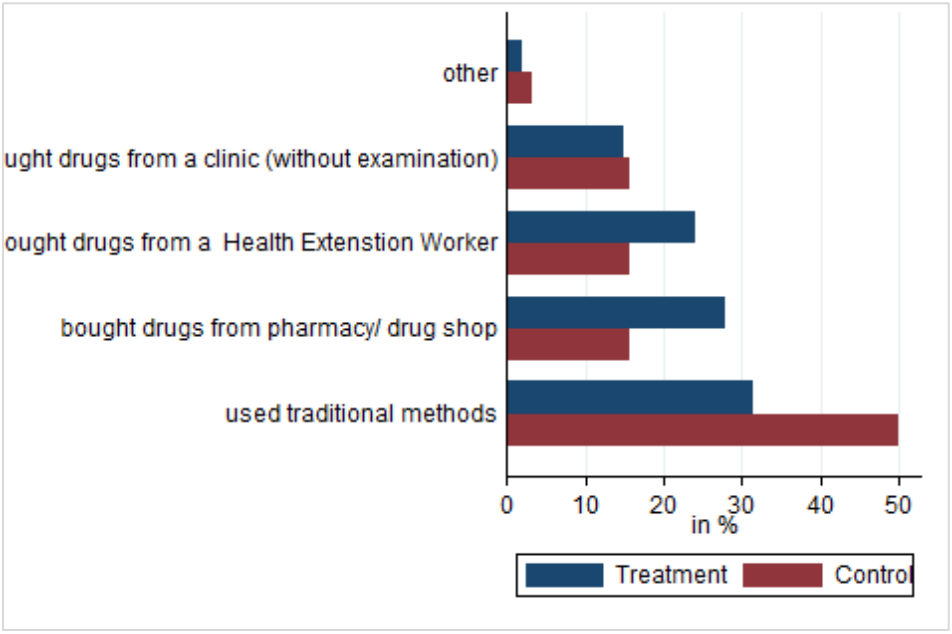


Figure 11: Self-Treatment by Treatment Status

There was not a significant difference in when infants had their first checkup following delivery. In treatment areas it was after 32 days and after 31 days in control areas (p=0.670).

Despite health behavior being similar between treatment and control areas, perceptions that the nearest health post was well-equipped for immunization (Table 7) were not independent of treatment status (Chi2=0.009). Perceptions were more favorable in the treatment areas.

Table 8: HP well-equipped for Immunizations by Treatment Status

HP well-equipped for immunizations	Treatment	Control
Very well equipped	23%	21%
Moderately well equipped	41%	37%
Fairly well equipped	31%	37%
Not equipped at all	4%	5%

Additionally, access to health posts was significantly different in treatment and control areas. In treatment areas it is a 28.6 minute walk to the health post whereas in control areas it is a 26.3 minute walk (p=0.004). In addition to the time being different, reported ease to travel to the health post (Table 8) was also not independent of treatment status (Chi2<0.000).

Table 9: Difficulty to Travel to Health Post, by Treatment Status

Difficulty to travel to health post	Treatment	Control
Very easy	50%	48%
Fairly easy	35%	40%
Fairly difficult	13%	9%
Very difficult	2%	4%

4. Conclusion

This report shows that key demographic, socioeconomic and health behavior indicators are balanced between the treatment and control groups. As expected, we find low literacy rates, a high proportion of traditional dwellings, and households who are on the lower end of the wealth spectrum. We also find significant room for improvement in health behavior, especially in the realm of immunization. While rates for immunization at birth are high, they drop off significantly and only 44% of children in treatment and control areas are vaccinated with the final vaccination, that for measles at 9 months.

5. Annex

5.1. List of Study Health Posts

slno	gov_HPID	ZA_HPID	Woreda	Health_Post_name	VillageKebele
13	1106	ZAHPID73	Adaa	Udee	Udee
7	7006	ZAHPID90	Fentale	Gelach	Gelach
15	9001	ZAHPID76	Adaa	Celeba Silasie	celeba
18	913	ZAHPID119	Zeway Dugda	Sango	Sango
7	1316	ZAHPID44	Bora	Gose Korke	Gose Korke
9	1243	ZAHPID60	Liben	Wara jarsa	Wara jarsa
5	1319	ZAHPID42	Bora	Tuka Langano	Tuka Langano
2	1105	ZAHPID62	Adaa	Keteba	Keteba
10	8002	ZAHPID96	Bora	D/Wedera / Berta Sami	D/Wedera / Berta Sami
10	82	ZAHPID22	Deksis	Keshte Koreta	Keshte Koreta
10	908	ZAHPID10	Zeway Dugda	Ubo Bericha	Ubo Bericha
5	7005	ZAHPID85	Fentale	Godo	Godo
4	44	ZAHPID16	Deksis	H/Andode	H/Andode
9	1112	ZAHPID69	Adaa	Katela	Katela
13	161	ZAHPID108	Zeway Dugda	Toya Leman	Toya Leman
2	1237	ZAHPID50	Liben	Kolba koticha	Kolba koticha
8	1330	ZAHPID45	Bora	Tuchi Deko	Tuchi Deko
11	1114	ZAHPID71	Adaa	Giche	Giche
5	268	ZAHPID29	Bele Gasgar	Koshimo	Koshimo
2	159	ZAHPID2	Zeway Dugda	Arba Chefe	Arba Chefe
4	902	ZAHPID4	Zeway Dugda	Senbero	Senbero
12	1234	ZAHPID104	Liben	Mume kosoro	Mume kosoro
1	166	ZAHPID1	Zeway Dugda	Golbe	Golbe
2	40	ZAHPID14	Deksis	D/Muraticha	D/Muraticha
11	83	ZAHPID23	Deksis	Tenekech Gefersa	Tenekech Gefersa
1	1103	ZAHPID61	Adaa	Akako	Akako
12	43	ZAHPID24	Deksis	Kashita korench/ Kacha Koshimo	Kashita korench/ Kacha Koshimo
1	265	ZAHPID25	Bele Gasgar	Teke	Teke
5	34	ZAHPID17	Deksis	Kara Lencha	Kara Lencha
7	271	ZAHPID33	Bele Gasgar	I.Golo	I.Golo
15	157	ZAHPID111	Zeway Dugda	Unshity	Unshity
12	267	ZAHPID93	Bele Gasgar	M.Jero	M.Jero
7	905	ZAHPID7	Zeway Dugda	Ganale	Ganale
4	1246	ZAHPID52	Liben	Liben gadula	Liben gadula
7	1242	ZAHPID56	Liben	Goteti goro	Goteti goro
3	1236	ZAHPID51	Liben	Dololo jila	Dololo jila
6	1322	ZAHPID43	Bora	Dalota Mati	Dalota Mati
6	904	ZAHPID6	Zeway Dugda	Burka lamafo	Burka lamafo
3	1329	ZAHPID39	Bora	Elan	Elan
12	1113	ZAHPID72	Adaa	Gobesaye	Gobesaye

slno	gov_HPID	ZA_HPID	Woreda	Health_Post_name	VillageKebele
8	36	ZAHPID20	Deksis	Huru kedidi	Huru kedidi
16	160	ZAHPID113	Zeway Dugda	Aboy Danaba	Sadisho
4	1327	ZAHPID40	Bora	Malima Beri	Malima Beri
4	269	ZAHPID28	Bele Gasgar	Darole	Darole
8	906	ZAHPID8	Zeway Dugda	Kule Sebero	Kule Sebero
10	1233	ZAHPID102	Liben	Elemo chukala	Elemo chukala
5	1123	ZAHPID65	Adaa	Yerer Silase	Yerer Silase
9	1318	ZAHPID47	Bora	Dodo / D/Wedera	Dodo/ D/Wedera
12	911	ZAHPID12	Zeway Dugda	Harata Tufa	Harata Tufa
14	1121	ZAHPID74	Adaa	Dire Shoki	Dire Shoki
11	1245	ZAHPID103	Liben	Oda jida	Oda jida
5	1241	ZAHPID53	Liben	Dire Doti	Dire Doti
5	903	ZAHPID5	Zeway Dugda	Shelad gota	Shelad gota
10	1110	ZAHPID70	Adaa	Kaliti	Kaliti
3	1376	ZAHPID83	Fentale	Gara Dima	Gara Dima
17	1119	ZAHPID78	Adaa	Boli Dirtu / G/Dirtu	Boli Dirtu/ G/Dirtu
3	266	ZAHPID27	Bele Gasgar	Oda Jerjero / Jida gobarbag	Oda Jerjero/ Jida gobarbag
2	1381	ZAHPID82	Fentale	Turo	Turo
2	1328	ZAHPID38	Bora	Gora Laman	Gora Laman
17	155	ZAHPID116	Zeway Dugda	Kiansho	Kiansho
4	1374	ZAHPID84	Fentale	Dire Saden	Dire Saden
11	910	ZAHPID11	Zeway Dugda	Meja Shenan	Meja Shenan
12	1320	ZAHPID99	Bora	Sory Doresa	Sory Doresa
3	37	ZAHPID15	Deksis	A/Kara	Bulala
5	7003	ZAHPID86	Fentale	Gidara	Gidara
9	259	ZAHPID34	Bele Gasgar	Adamit-Jaro	Adamit-Jaro
8	1238	ZAHPID58	Liben	Gachi dai'mo	Gachi dai'mo
6	1108	ZAHPID66	Adaa	Tulu Dimtu	Tulu Dimtu
15	1117	ZAHPID75	Adaa	Wajitu	Wajitu
6	270	ZAHPID30	Bele Gasgar	G.Nagaya	G.Nagaya
1	1239	ZAHPID49	Liben	Adele micha	Adele micha
10	801	ZAHPID36	Bele Gasgar	Akia Kerbigry	Akia Kerbigry
6	38	ZAHPID18	Deksis	Bulbula Leman	Bulbula Leman
7	81	ZAHPID19	Deksis	Gesela muta	Gesela muta
6	1240	ZAHPID55	Liben	Jara goro	Jara goro
9	42	ZAHPID21	Deksis	S/Abutaye	S/Abutaye
11	261	ZAHPID92	Bele Gasgar	Arbogne-Golo	Arbogne-Golo
1	1326	ZAHPID37	Bora	Tube Suti	Tube Suti
14	162	ZAHPID109	Zeway Dugda	Dugda Batu	Dugda Batu
11	1321	ZAHPID98	Bora	Jerme Bora	Jerme Bora
7	1107	ZAHPID67	Adaa	Karfe	Karfe
10	601	ZAHPID35	Bele Gasgar	Lemet esawa / Isawa Lamati	Lemet esawa/ Isawa Lamati
9	907	ZAHPID9	Zeway Dugda	Demitu Rareti	Demitu Rareti
3	1122	ZAHPID63	Adaa	Koftu	Koftu
4	1116	ZAHPID64	Adaa	Tedecha	Tedecha
1	39	ZAHPID13	Deksis	Hela Wolkite	Hela Wolkite

slno	gov_HPID	ZA_HPID	Woreda	Health_Post_name	VillageKebele
8	262	ZAHPID32	Bele Gasgar	Shankaro-Adaga	Shankaro-Adaga
3	901	ZAHPID3	Zeway Dugda	Halo	Halo
8	1109	ZAHPID68	Adaa	Deko	Deko
16	1118	ZAHPID77	Adaa	Golbo	Golbo

5.2. Baseline Balancing Analysis, Additional Tables

Baseline Balancing Table 1: Continuous Variables, Single Records Dataset

Variable	Treatment	Control	ttest	p_value
G1A_NUMBER_OF_VISIT	1.019	1.019	-0.004	0.996
B5_AGE	26.955	27.251	1.197	0.231
B9_BOYS_EVER_BORN	1.816	1.778	-0.686	0.493
B10_GIRLS_EVER_BORN	1.824	1.778	-0.798	0.425
B11_CHILDREN_EVER_BORN	3.640	3.556	-0.960	0.337
C1_NUMBER_OF_LIVE_AND_EAT	5.992	6.000	0.091	0.928
C2_NUMBER_OF_WOMEN	2.971	2.982	0.197	0.844
C3_NUMBER_OF_MEN	3.021	3.018	-0.049	0.961
C4_NUMBER_OF_GIRLS_UNDER_5Y	0.793	0.721	-2.581	0.010
C5_NUMBER_OF_BOYS_UNDER_5Y	0.718	0.703	-0.588	0.557
C6_NUMBER_OF_GIRLS_UNDER_2Y	0.520	0.517	-0.152	0.879
C7_NUMBER_OF_BOYS_UNDER_2Y	0.508	0.511	0.186	0.853
D21_POTENTIAL_ADULT_WORKER	2.695	2.832	2.402	0.016
D23_MONTHLY_FOOD_EXPENDITURE	990.757	1049.914	2.237	0.025
F15_WALK_FROM_HOME_TO_HP	28.599	26.326	-2.886	0.004
F18_DISTANCE_LOCAL_TO_HP	29.689	25.768	-4.778	0.000
F30_WHEN_WAS_HEW_VIST_HOME	4.317	3.848	-1.908	0.057
F34_BABY_1ST_CHECKUP	32.089	30.953	-0.427	0.670
F37_1ST_VIST_AFTER_DELIVERY_HW	43.648	44.072	0.075	0.940
F38_2ND_VIST_AFTER_DELIVERY	115.219	100.426	-1.349	0.178
WEALTH_INDEX	0.395	0.393	-0.140	0.888

Baseline Balancing Table 2: Categorical Variables, Single Records Dataset

Variable	label	Treatment	Control	chi2	p_chi2
A10_AREA	Rural	98.067	98.888	3.030	0.082
A10_AREA	Urban	1.933	1.112	3.030	0.082
B12_HIGHEST_LEVEL_EDUCATION	No school level completed	58.439	57.302	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	Some years of primary	29.219	30.393	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	Primary completed	4.535	4.448	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	Some years of junior / lower secondary	3.643	2.520	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	junior / lower secondary completed	2.974	2.743	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	Senior / upper secondary completed	0.446	0.890	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	Some years of higher education / university	0.520	0.964	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	Senior / upper secondary completed	0.074	0.445	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	Some years of higher education / university	0.074	0.222	11.670	0.233
B12_HIGHEST_LEVEL_EDUCATION	Higher education / university completed	0.074	0.074	11.670	0.233
B13_READ_WRITE_STATUS	Yes	33.457	32.765	0.146	0.703
B13_READ_WRITE_STATUS	No	66.543	67.235	0.146	0.703
B14_LAST_7DAYS_WORK_STATUS	Yes	96.654	95.330	3.070	0.080
B14_LAST_7DAYS_WORK_STATUS	No	3.346	4.670	3.070	0.080
B15_NOT_AVAILABLE_TOWORK	Yes	51.111	57.143	0.385	0.535
B15_NOT_AVAILABLE_TOWORK	No	48.889	42.857	0.385	0.535
B16_LAST_12MONTHS_WORK_STATUS	Yes	99.628	99.629	0.000	0.996
B16_LAST_12MONTHS_WORK_STATUS	No	0.372	0.371	0.000	0.996
B17_MAIN_OCCUPATION	Farmer	8.030	5.708	32.363	0.000
B17_MAIN_OCCUPATION	Housewife	88.996	87.027	32.363	0.000
B17_MAIN_OCCUPATION	Handicraft	0.223	0.445	32.363	0.000
B17_MAIN_OCCUPATION	Trader	1.338	2.817	32.363	0.000
B17_MAIN_OCCUPATION	Casual laborer	0.520	0.890	32.363	0.000
B17_MAIN_OCCUPATION	Employed in the private sector	0.074	0.074	32.363	0.000
B17_MAIN_OCCUPATION	Government employee	0.000	0.074	32.363	0.000
B17_MAIN_OCCUPATION	Teacher	0.149	0.519	32.363	0.000
B17_MAIN_OCCUPATION	Health professional (e.g. medical doctor, nurse, midwife, healer)	0.669	2.446	32.363	0.000

B18_WORK_TYPE	through out the year	80.074	74.055	18.876	0.000
B18_WORK_TYPE	seasonally/Part of the Year	19.554	24.537	18.876	0.000
B18_WORK_TYPE	one in a while	0.372	1.408	18.876	0.000
B19_COMMUNITY_HEALTH_MEMBER	Yes	33.903	21.497	51.768	0.000
B19_COMMUNITY_HEALTH_MEMBER	No	66.097	78.503	51.768	0.000
C8_HEAD_OF_HOUSEHOLD	Yes	7.658	4.670	10.398	0.001
C8_HEAD_OF_HOUSEHOLD	No	92.342	95.330	10.398	0.001
C9_RELATIONSHIP_TO_HOH	wife / Husband	98.309	96.890	10.066	0.073
C9_RELATIONSHIP_TO_HOH	Sister/ Brother	0.081	0.078	10.066	0.073
C9_RELATIONSHIP_TO_HOH	Child of HoH	0.564	1.166	10.066	0.073
C9_RELATIONSHIP_TO_HOH	Parent of HoH	0.886	1.711	10.066	0.073
C9_RELATIONSHIP_TO_HOH	Other-relative	0.161	0.000	10.066	0.073
C9_RELATIONSHIP_TO_HOH	Not related	0.000	0.156	10.066	0.073
C11_SEX_OF_HOH	Male	92.862	95.033	5.584	0.018
C11_SEX_OF_HOH	Female	7.138	4.967	5.584	0.018
C12_ETHNIC_OF_HOH	Oromo	97.844	97.035	1.766	0.184
C12_ETHNIC_OF_HOH	Other	2.156	2.965	1.766	0.184
C13_RELIGION_OF_HOH	Ortodox Christian	41.784	52.261	49.970	0.000
C13_RELIGION_OF_HOH	Catholic Christian	0.223	0.222	49.970	0.000
C13_RELIGION_OF_HOH	Protestant Christian	6.171	8.970	49.970	0.000
C13_RELIGION_OF_HOH	Muslim	49.145	36.027	49.970	0.000
C13_RELIGION_OF_HOH	Other	2.677	2.520	49.970	0.000
C14_LAST_7DAYS_WORK_STATUS	Yes	99.195	99.456	0.644	0.422
C14_LAST_7DAYS_WORK_STATUS	No	0.805	0.544	0.644	0.422
C15_NOT_AVAILABLE_TO_WORK	Yes	100.000	85.714	1.518	0.218
C15_NOT_AVAILABLE_TO_WORK	No	0.000	14.286	1.518	0.218
C16_LAST_12M_WORK_STATUS	Yes	99.839	99.456	2.617	0.106
C16_LAST_12M_WORK_STATUS	No	0.161	0.544	2.617	0.106
C17_MAIN_OCCUPATION	Farmer	93.720	89.347	22.062	0.037
C17_MAIN_OCCUPATION	Housewife	0.483	0.622	22.062	0.037
C17_MAIN_OCCUPATION	Handicraft	0.483	0.700	22.062	0.037
C17_MAIN_OCCUPATION	Trader	0.966	1.944	22.062	0.037
C17_MAIN_OCCUPATION	Casual labourer	1.530	3.655	22.062	0.037
C17_MAIN_OCCUPATION	Employed in the private sector	0.725	0.622	22.062	0.037
C17_MAIN_OCCUPATION	Government employee	0.966	1.166	22.062	0.037
C17_MAIN_OCCUPATION	Teacher	0.725	1.400	22.062	0.037
C17_MAIN_OCCUPATION	Health professional (e.g. medical doctor, nurse, midwife, healer)	0.000	0.078	22.062	0.037
C17_MAIN_OCCUPATION	Livestock and dairy producer/pastoralist	0.161	0.156	22.062	0.037
C17_MAIN_OCCUPATION	Domestic chores inside the home (non-agricultural, e.g. child raising, cooking)	0.081	0.078	22.062	0.037
C17_MAIN_OCCUPATION	Veterinary technician	0.000	0.078	22.062	0.037

C17_MAIN_OCCUPATION	Fishery worker	0.161	0.156	22.062	0.037
C18_TYPE_OF_WORK	Through out the year	72.464	68.740	8.474	0.014
C18_TYPE_OF_WORK	Seasonally/Part of the Year	27.536	30.871	8.474	0.014
C18_TYPE_OF_WORK	One in a while	0.000	0.389	8.474	0.014
C19_HIGHEST_SCHOOL_GRADE	No school level completed	37.681	39.658	15.788	0.046
C19_HIGHEST_SCHOOL_GRADE	Some years of primary	38.164	36.314	15.788	0.046
C19_HIGHEST_SCHOOL_GRADE	Primary completed	7.085	7.309	15.788	0.046
C19_HIGHEST_SCHOOL_GRADE	Some years of junior / lower secondary	5.717	4.666	15.788	0.046
C19_HIGHEST_SCHOOL_GRADE	Junior / lower secondary completed	6.441	5.288	15.788	0.046
C19_HIGHEST_SCHOOL_GRADE	Some years of senior / upper secondary	0.966	1.711	15.788	0.046
C19_HIGHEST_SCHOOL_GRADE	Senior / upper secondary completed	2.415	2.255	15.788	0.046
C19_HIGHEST_SCHOOL_GRADE	Some years of higher education / university	1.369	1.711	15.788	0.046
C19_HIGHEST_SCHOOL_GRADE	Higher education / university completed	0.161	1.089	15.788	0.046
D1_TYPE_OF_DWELLING	Non-traditional house (e.g. from concrete, bricks or wood)	26.691	36.842	37.279	0.000
D1_TYPE_OF_DWELLING	Traditional house / hut (e.g. from thatch or mud)	72.565	61.898	37.279	0.000
D1_TYPE_OF_DWELLING	Informal structure or shack	0.595	0.667	37.279	0.000
D1_TYPE_OF_DWELLING	Tent	0.074	0.371	37.279	0.000
D1_TYPE_OF_DWELLING	Flat in a block of flats	0.000	0.074	37.279	0.000
D1_TYPE_OF_DWELLING	Single room in a larger dwelling structure or backyard	0.074	0.148	37.279	0.000
D3_TYPE_OF_ROOF	Mud	2.007	4.299	53.507	0.000
D3_TYPE_OF_ROOF	Thatch	54.349	43.069	53.507	0.000
D3_TYPE_OF_ROOF	Wood	3.941	5.708	53.507	0.000
D3_TYPE_OF_ROOF	Tin/Iron sheets	38.067	45.219	53.507	0.000
D3_TYPE_OF_ROOF	Cement/concrete	0.074	0.148	53.507	0.000
D3_TYPE_OF_ROOF	Roofing tiles	1.487	0.741	53.507	0.000
D3_TYPE_OF_ROOF	Asbestos	0.074	0.667	53.507	0.000
D3_TYPE_OF_ROOF	Cardboard	0.000	0.148	53.507	0.000
D4_TYPE_OF_FLOOR	Mud/dung	94.870	94.514	24.580	0.000

D4_TYPE_OF_FLOOR	Thatch	0.669	0.593	24.580	0.000
D4_TYPE_OF_FLOOR	Wood	1.561	0.148	24.580	0.000
D4_TYPE_OF_FLOOR	Tin/Iron sheets	0.297	0.222	24.580	0.000
D4_TYPE_OF_FLOOR	Cement/concrete	2.602	4.299	24.580	0.000
D4_TYPE_OF_FLOOR	Cardboard	0.000	0.222	24.580	0.000
D5_MAIN_SOURCE_OF_WATER	Piped into dwelling or compound (formal)	1.710	1.927	46.278	0.000
D5_MAIN_SOURCE_OF_WATER	Piped into dwelling or compound (rented/informal)	11.599	6.449	46.278	0.000
D5_MAIN_SOURCE_OF_WATER	Public outdoor tap or borehole	47.658	52.854	46.278	0.000
D5_MAIN_SOURCE_OF_WATER	Well with a cover	6.245	6.672	46.278	0.000
D5_MAIN_SOURCE_OF_WATER	Well without a cover, or rain water	7.212	3.855	46.278	0.000
D5_MAIN_SOURCE_OF_WATER	River, lake, pond	18.959	20.015	46.278	0.000
D5_MAIN_SOURCE_OF_WATER	Vendor or truck	5.725	5.930	46.278	0.000
D5_MAIN_SOURCE_OF_WATER	Other	0.892	2.298	46.278	0.000
D6_TYPE_OF_ELECTRICCITY_SUPPLY	Electricity supply (from grid)	8.848	11.045	7.093	0.029
D6_TYPE_OF_ELECTRICCITY_SUPPLY	Electricity from a generator	9.145	11.045	7.093	0.029
D6_TYPE_OF_ELECTRICCITY_SUPPLY	Other source of electricity	82.007	77.910	7.093	0.029
D7_ELECTRICITY_AVAILABLE	Yes	28.512	28.859	0.008	0.929
D7_ELECTRICITY_AVAILABLE	No	71.488	71.141	0.008	0.929
D8_TYPE_OF_FUEL_FOR_COOKING	Fire wood	84.312	81.319	8.690	0.122
D8_TYPE_OF_FUEL_FOR_COOKING	Charcoal	0.669	0.815	8.690	0.122
D8_TYPE_OF_FUEL_FOR_COOKING	Crop residue	0.000	0.074	8.690	0.122
D8_TYPE_OF_FUEL_FOR_COOKING	Dung/manure	14.572	17.569	8.690	0.122
D8_TYPE_OF_FUEL_FOR_COOKING	Butane gas	0.000	0.074	8.690	0.122
D8_TYPE_OF_FUEL_FOR_COOKING	Kerosene	0.446	0.148	8.690	0.122
D9_KIND_OF_TOILET_FACILITY	Pit Latrine/traditional pit toilet	53.309	50.408	5.477	0.242
D9_KIND_OF_TOILET_FACILITY	Ventilated improved pit latrine (VIP)	0.223	0.222	5.477	0.242
D9_KIND_OF_TOILET_FACILITY	Flush toilet	4.015	4.299	5.477	0.242
D9_KIND_OF_TOILET_FACILITY	No facility/Bush/Field	42.230	45.070	5.477	0.242
D9_KIND_OF_TOILET_FACILITY	Other	0.223	0.000	5.477	0.242
D10_TOILET_DWELLING_SHARED	Toilet is just for this dwelling	81.654	84.076	3.968	0.138
D10_TOILET_DWELLING_SHARED	Toilet is shared with other dwellings (e.g. toilet block)	18.346	15.655	3.968	0.138
D10_TOILET_DWELLING_SHARED	Other (e.g. open-air toilet or no fixed toilet)	0.000	0.270	3.968	0.138
D11A_FUNCTIONAL_RADIO	Yes	39.331	41.883	1.819	0.177
D11A_FUNCTIONAL_RADIO	No	60.669	58.117	1.819	0.177
D11B_FUNCTIONAL_TV	Yes	4.089	4.299	0.074	0.785

D11B_FUNCTIONAL_TV	No	95.911	95.701	0.074	0.785
D12A_BICYCLE	Yes	2.677	1.408	5.416	0.020
D12A_BICYCLE	No	97.323	98.592	5.416	0.020
D12B_MOTORCYCLE	Yes	2.156	0.741	9.450	0.002
D12B_MOTORCYCLE	No	97.844	99.259	9.450	0.002
D12C_ELECTRIC_GRIDDLE	Yes	0.223	0.148	0.203	0.652
D12C_ELECTRIC_GRIDDLE	No	99.777	99.852	0.203	0.652
D12D_KEROSEN_LAMPS	Yes	15.688	12.083	7.320	0.007
D12D_KEROSEN_LAMPS	No	84.312	87.917	7.320	0.007
D12E_BED_OR_TABLES	Yes	69.442	65.678	4.354	0.037
D12E_BED_OR_TABLES	No	30.558	34.322	4.354	0.037
D12F_BOOKS	Yes	52.639	47.813	6.275	0.012
D12F_BOOKS	No	47.361	52.187	6.275	0.012
D12G_PHONE	Yes	65.725	66.345	0.116	0.734
D12G_PHONE	No	34.275	33.655	0.116	0.734
D12H_REFRIGERATOR	Yes	0.223	0.741	3.767	0.052
D12H_REFRIGERATOR	No	99.777	99.259	3.767	0.052
D13_HH_INCOME_CONSENT	Yes	92.416	94.885	6.905	0.009
D13_HH_INCOME_CONSENT	No	7.584	5.115	6.905	0.009
D14_OWN_LAND_ALONE_OR_JOINTLY	Alone only	78.037	77.813	12.180	0.007
D14_OWN_LAND_ALONE_OR_JOINTLY	Jointly only	3.057	3.359	12.180	0.007
D14_OWN_LAND_ALONE_OR_JOINTLY	Both alone and jointly	4.988	2.578	12.180	0.007
D14_OWN_LAND_ALONE_OR_JOINTLY	Does not own any land	13.918	16.250	12.180	0.007
D15_SIZE_OF_THE_LAND	more than half a hectare of land	59.813	54.291	12.269	0.002
D15_SIZE_OF_THE_LAND	less than half a hectare of land	26.729	33.675	12.269	0.002
D15_SIZE_OF_THE_LAND	exactly half a hectare of land	13.458	12.034	12.269	0.002
D16_SIZE_OF_CALTIVATED_LAND	more than half a hectare of land	54.953	49.160	12.543	0.002
D16_SIZE_OF_CALTIVATED_LAND	less than half a hectare of land	31.589	38.899	12.543	0.002
D16_SIZE_OF_CALTIVATED_LAND	exactly half a hectare of land	13.458	11.940	12.543	0.002
D17_OWN_LARGE_LIVESTOCK	Yes	77.635	77.266	0.049	0.824
D17_OWN_LARGE_LIVESTOCK	No	22.365	22.734	0.049	0.824
D18_OWN_MEDIUM_LIVESTOCK	Yes	55.591	54.844	0.143	0.706
D18_OWN_MEDIUM_LIVESTOCK	No	44.409	45.156	0.143	0.706
D19_OWN_SMALL_LIVESTOCK	Yes	55.109	54.219	0.201	0.654
D19_OWN_SMALL_LIVESTOCK	No	44.891	45.781	0.201	0.654
D20A_MILKCOWS_OXEN	Not mentioned	22.767	23.828	0.397	0.529
D20A_MILKCOWS_OXEN	Mentioned	77.233	76.172	0.397	0.529
D20B_HOURSES	Not mentioned	83.508	84.922	0.949	0.330
D20B_HOURSES	Mentioned	16.492	15.078	0.949	0.330
D20C_DONKEYS	Not mentioned	49.477	45.703	3.601	0.058
D20C_DONKEYS	Mentioned	50.523	54.297	3.601	0.058
D20D_MULES	Not mentioned	98.311	97.813	0.821	0.365
D20D_MULES	Mentioned	1.689	2.188	0.821	0.365
D20E_GOATS	Not mentioned	71.279	75.391	5.455	0.020
D20E_GOATS	Mentioned	28.721	24.609	5.455	0.020

D20F_SHEEP	Not mentioned	62.269	58.984	2.849	0.091
D20F_SHEEP	Mentioned	37.731	41.016	2.849	0.091
D20G_CHICKENS	Not mentioned	41.915	42.578	0.114	0.736
D20G_CHICKENS	Mentioned	58.085	57.422	0.114	0.736
D22_MONEY_FROM_ANY_SOURCE	Yes	41.191	36.172	6.699	0.010
D22_MONEY_FROM_ANY_SOURCE	No	58.809	63.828	6.699	0.010
D25_PHRASE_BEST_SUITS_HH	Unable to meet basic needs without charity	23.089	26.641	5.133	0.274
D25_PHRASE_BEST_SUITS_HH	able to meet basic needs	51.488	50.156	5.133	0.274
D25_PHRASE_BEST_SUITS_HH	able to meet basic needs with some non-essential goods	22.043	19.922	5.133	0.274
D25_PHRASE_BEST_SUITS_HH	able to purchase most non-essential goods	3.298	3.125	5.133	0.274
D25_PHRASE_BEST_SUITS_HH	plenty of disposable income	0.080	0.156	5.133	0.274
D26A_FEELING_HUNGRY	Never	62.027	57.031	13.171	0.004
D26A_FEELING_HUNGRY	Just one or two days	28.560	29.375	13.171	0.004
D26A_FEELING_HUNGRY	Many days (more than ten)	9.091	13.359	13.171	0.004
D26A_FEELING_HUNGRY	Most days/Always	0.322	0.234	13.171	0.004
D26B_WITHOUT_CLEAN_WATER	Never	50.282	36.484	51.461	0.000
D26B_WITHOUT_CLEAN_WATER	Just one or two days	26.388	31.328	51.461	0.000
D26B_WITHOUT_CLEAN_WATER	Many days (more than ten)	15.125	21.797	51.461	0.000
D26B_WITHOUT_CLEAN_WATER	Most days/Always	8.206	10.391	51.461	0.000
D26C_GONE_WITHOUT_MEDICINE	Never	35.559	29.219	18.272	0.000
D26C_GONE_WITHOUT_MEDICINE	Just one or two days	40.547	40.938	18.272	0.000
D26C_GONE_WITHOUT_MEDICINE	Many days (more than ten)	23.331	28.516	18.272	0.000
D26C_GONE_WITHOUT_MEDICINE	Most days/Always	0.563	1.328	18.272	0.000
D26D_WITHOUT_CASH_INCOME	Never	25.905	21.406	8.123	0.044
D26D_WITHOUT_CASH_INCOME	Just one or two days	32.582	35.781	8.123	0.044
D26D_WITHOUT_CASH_INCOME	Many days (more than ten)	39.662	40.469	8.123	0.044
D26D_WITHOUT_CASH_INCOME	Most days/Always	1.850	2.344	8.123	0.044
D27_HH_FINANICAL_SITUATION	Very Poor	2.092	3.828	8.001	0.092
D27_HH_FINANICAL_SITUATION	Poor	39.340	39.609	8.001	0.092
D27_HH_FINANICAL_SITUATION	Moderatly poor	55.270	53.047	8.001	0.092
D27_HH_FINANICAL_SITUATION	Rich	2.977	3.359	8.001	0.092
D27_HH_FINANICAL_SITUATION	Very reach	0.322	0.156	8.001	0.092
D28_WHERE_WOULD_PLACE_HH	Very Poor	0.563	1.641	7.466	0.113
D28_WHERE_WOULD_PLACE_HH	Poor	30.652	31.953	7.466	0.113
D28_WHERE_WOULD_PLACE_HH	Moderatly poor	67.418	65.078	7.466	0.113
D28_WHERE_WOULD_PLACE_HH	Rich	1.287	1.250	7.466	0.113
D28_WHERE_WOULD_PLACE_HH	Very reach	0.080	0.078	7.466	0.113
F13A_GOVERNMENT_HOSPITAL	Not mentioned	96.580	96.961	0.312	0.576
F13A_GOVERNMENT_HOSPITAL	Mentioned	3.420	3.039	0.312	0.576
F13B_GOVT_HEALTH_CENTER	Not mentioned	68.178	67.976	0.013	0.910
F13B_GOVT_HEALTH_CENTER	Mentioned	31.822	32.024	0.013	0.910

F13C_GOVT_HEALTH_POST	Not mentioned	2.825	2.520	0.241	0.624
F13C_GOVT_HEALTH_POST	Mentioned	97.175	97.480	0.241	0.624
F13D_HEALTH_EXTENTION_WORKER	Not mentioned	31.004	26.019	8.210	0.004
F13D_HEALTH_EXTENTION_WORKER	Mentioned	68.996	73.981	8.210	0.004
F13E_PRIVATE_PROFIT_CLINIC	Not mentioned	82.082	89.400	29.508	0.000
F13E_PRIVATE_PROFIT_CLINIC	Mentioned	17.918	10.600	29.508	0.000
F13F_NGO_GOVT_CLINIC_HOSP	Not mentioned	99.108	98.814	0.565	0.452
F13F_NGO_GOVT_CLINIC_HOSP	Mentioned	0.892	1.186	0.565	0.452
F13G_TRADITIONAL_HEALER	Not mentioned	95.465	96.516	1.934	0.164
F13G_TRADITIONAL_HEALER	Mentioned	4.535	3.484	1.934	0.164
F13H_PHARMACY_DRUG_SHOP	Not mentioned	95.316	98.666	25.913	0.000
F13H_PHARMACY_DRUG_SHOP	Mentioned	4.684	1.334	25.913	0.000
F13I_OTHER	Not mentioned	100.000	100.000		
F14_CLOSEST_HEALTH_SERVICE	Government Hospital	0.074	0.371	41.827	0.000
F14_CLOSEST_HEALTH_SERVICE	Government health center	6.245	11.564	41.827	0.000
F14_CLOSEST_HEALTH_SERVICE	Government Health post	88.104	84.285	41.827	0.000
F14_CLOSEST_HEALTH_SERVICE	Health Extension worker	2.751	2.891	41.827	0.000
F14_CLOSEST_HEALTH_SERVICE	Private for profit clinic/hospital	2.602	0.815	41.827	0.000
F14_CLOSEST_HEALTH_SERVICE	Non-governmental (NGO) clinic /hospital	0.223	0.000	41.827	0.000
F14_CLOSEST_HEALTH_SERVICE	Traditional healer e.g. herbalist, spiritual healer	0.000	0.074	41.827	0.000
F16A_DISTRICT_HEALTH_POST	Yes	96.208	95.107	1.964	0.161
F16A_DISTRICT_HEALTH_POST	No	3.792	4.893	1.964	0.161
F16B_DISTRICT_HEALTH_POST	Yes, knows where the districts health office is	98.686	99.299	2.557	0.279
F16B_DISTRICT_HEALTH_POST	No, doesn?t know where it is	0.773	0.468	2.557	0.279
F16B_DISTRICT_HEALTH_POST	Doesn?t know of any districts health office	0.541	0.234	2.557	0.279
F17_LAST_5YRS_HP_BUILT	Yes	64.642	54.738	26.104	0.000
F17_LAST_5YRS_HP_BUILT	No	35.358	45.262	26.104	0.000
F19_LAST_YEAR_HP_VISIT	Yes	79.361	79.248	0.005	0.944
F19_LAST_YEAR_HP_VISIT	No	20.639	20.752	0.005	0.944
F20_DIFFICULT_TO_TRAVEL_HP	Very easy	49.844	47.925	22.484	0.000
F20_DIFFICULT_TO_TRAVEL_HP	Fairly easy	35.202	39.546	22.484	0.000
F20_DIFFICULT_TO_TRAVEL_HP	Fairly difficult	12.928	8.614	22.484	0.000
F20_DIFFICULT_TO_TRAVEL_HP	Very difficult	2.025	3.915	22.484	0.000
F21_HP_WELL_EQUIPED	Very well equipped	11.916	8.927	7.923	0.048
F21_HP_WELL_EQUIPED	Moderately well equipped	46.262	45.341	7.923	0.048
F21_HP_WELL_EQUIPED	Fairly well equipped	29.050	31.402	7.923	0.048
F21_HP_WELL_EQUIPED	Not equipped at all	12.773	14.330	7.923	0.048
F22_HP_WELL_EQUIPED_FOR_IMMU	Very well equipped	23.131	20.830	11.590	0.009

F22_HP_WELL_EQUIPED_FOR_IMMU	Moderately well equiped	41.199	36.962	11.590	0.009
F22_HP_WELL_EQUIPED_FOR_IMMU	Fairly well equiped	31.231	37.197	11.590	0.009
F22_HP_WELL_EQUIPED_FOR_IMMU	Not equiped at all	4.439	5.012	11.590	0.009
F23_RATE_S_PROVIDED_HEW	Very satisfies	24.221	19.342	27.292	0.000
F23_RATE_S_PROVIDED_HEW	Moderatly satisfies	50.312	46.045	27.292	0.000
F23_RATE_S_PROVIDED_HEW	Firly satisfies	21.184	28.583	27.292	0.000
F23_RATE_S_PROVIDED_HEW	Disappointed	4.283	6.030	27.292	0.000
F24_SERVIES_SATISFACTION	Very satisfies	19.626	13.861	22.777	0.000
F24_SERVIES_SATISFACTION	Moderatly satisfies	50.156	49.021	22.777	0.000
F24_SERVIES_SATISFACTION	Firly satisfies	26.713	32.028	22.777	0.000
F24_SERVIES_SATISFACTION	Disappointed	3.505	5.090	22.777	0.000
F26A_FAMILY_PLANNING	Not mentioned	58.879	60.689	0.873	0.350
F26A_FAMILY_PLANNING	Mentioned	41.121	39.311	0.873	0.350
F26B_CHILD_IMMUNIZATION	Not mentioned	28.894	31.637	2.282	0.131
F26B_CHILD_IMMUNIZATION	Mentioned	71.106	68.363	2.282	0.131
F26C_ANTENATAL_CARE	Not mentioned	72.430	71.809	0.123	0.726
F26C_ANTENATAL_CARE	Mentioned	27.570	28.191	0.123	0.726
F26D_POSTNATAL_CARE	Not mentioned	88.551	92.796	13.630	0.000
F26D_POSTNATAL_CARE	Mentioned	11.449	7.204	13.630	0.000
F26E_HEALTH_EDUCATION	Not mentioned	93.925	95.771	4.464	0.035
F26E_HEALTH_EDUCATION	Mentioned	6.075	4.229	4.464	0.035
F26F_GROWTH_MONITORING	Not mentioned	92.368	96.163	17.045	0.000
F26F_GROWTH_MONITORING	Mentioned	7.632	3.837	17.045	0.000
F26G_REFERRAL_OF_SICK_CHILD	Not mentioned	97.118	97.494	0.345	0.557
F26G_REFERRAL_OF_SICK_CHILD	Mentioned	2.882	2.506	0.345	0.557
F26H_DIARRHEA_TREATMENT	Not mentioned	94.860	96.006	1.930	0.165
F26H_DIARRHEA_TREATMENT	Mentioned	5.140	3.994	1.930	0.165
F26I_MALARIA_TREATMENT	Not mentioned	93.536	94.440	0.926	0.336
F26I_MALARIA_TREATMENT	Mentioned	6.464	5.560	0.926	0.336
F26J_PNEUMONIA_TREATMENT	Not mentioned	96.807	97.807	2.445	0.118
F26J_PNEUMONIA_TREATMENT	Mentioned	3.193	2.193	2.445	0.118
F26K_PROVIDE_OR_SELL_BED_NET	Not mentioned	90.187	94.362	15.643	0.000
F26K_PROVIDE_OR_SELL_BED_NET	Mentioned	9.813	5.638	15.643	0.000
F26L_DELIVERY_CARE	Not mentioned	89.252	92.561	8.473	0.004
F26L_DELIVERY_CARE	Mentioned	10.748	7.439	8.473	0.004
F26M_NEONATAL_CARE	Not mentioned	89.174	92.561	8.843	0.003
F26M_NEONATAL_CARE	Mentioned	10.826	7.439	8.843	0.003
F26N_OTHER_REASON_HP_VISIT	Not mentioned	99.688	99.765	0.138	0.710
F26N_OTHER_REASON_HP_VISIT	Mentioned	0.312	0.235	0.138	0.710
F27_HEARD_OF_ABOUT_HEW	Yes	91.970	87.769	13.055	0.000
F27_HEARD_OF_ABOUT_HEW	No	8.030	12.231	13.055	0.000
F28A_IMMUNIZATION	Not mentioned	7.357	8.193	0.590	0.442
F28A_IMMUNIZATION	Mentioned	92.643	91.807	0.590	0.442
F28B_INFO_ON_CHILD_NUTRITION	Not mentioned	35.570	44.341	19.416	0.000
F28B_INFO_ON_CHILD_NUTRITION	Mentioned	64.430	55.659	19.416	0.000
F28C_INFO_ON_DIARRHEA	Not mentioned	71.706	71.622	0.002	0.963
F28C_INFO_ON_DIARRHEA	Mentioned	28.294	28.378	0.002	0.963
F28D_INFO_ON_PREGNANCY_CARE	Not mentioned	66.209	69.257	2.570	0.109
F28D_INFO_ON_PREGNANCY_CARE	Mentioned	33.791	30.743	2.570	0.109
F28E_INFORMATION_ON_HIV_AIDS	Not mentioned	72.676	71.115	0.730	0.393
F28E_INFORMATION_ON_HIV_AIDS	Mentioned	27.324	28.885	0.730	0.393
F28F_INFORMATION_ON_HYGIENE	Not mentioned	35.651	36.233	0.089	0.765

F28F_INFORMATION_ON_HYGIENE	Mentioned	64.349	63.767	0.089	0.765
F28G_PROMOTION_PIT_LATRINE	Not mentioned	33.468	27.111	11.562	0.001
F28G_PROMOTION_PIT_LATRINE	Mentioned	66.532	72.889	11.562	0.001
F28H_PROMOTE_LATRINE_USE	Not mentioned	38.884	36.402	1.588	0.208
F28H_PROMOTE_LATRINE_USE	Mentioned	61.116	63.598	1.588	0.208
F28I_PROMOTE_SAFE_WATER_USE	Not mentioned	56.346	56.672	0.026	0.871
F28I_PROMOTE_SAFE_WATER_USE	Mentioned	43.654	43.328	0.026	0.871
F28J_INFO_ON_FAMILY_PLAN	Not mentioned	69.038	71.199	1.348	0.246
F28J_INFO_ON_FAMILY_PLAN	Mentioned	30.962	28.801	1.348	0.246
F28K_MENTAL_HEALTH	Not mentioned	93.614	93.328	0.081	0.776
F28K_MENTAL_HEALTH	Mentioned	6.386	6.672	0.081	0.776
F28L_FAMILY_PLANNING	Not mentioned	69.361	75.760	12.421	0.000
F28L_FAMILY_PLANNING	Mentioned	30.639	24.240	12.421	0.000
F28M_PREVENTION_CONTROL_HIV	Not mentioned	85.530	89.274	7.680	0.006
F28M_PREVENTION_CONTROL_HIV	Mentioned	14.470	10.726	7.680	0.006
F28N_PREVENTION_OF_MALARIA	Not mentioned	82.700	85.304	3.048	0.081
F28N_PREVENTION_OF_MALARIA	Mentioned	17.300	14.696	3.048	0.081
F28O_PREV_OF_ACCIDENT_TRAUMA	Not mentioned	92.805	94.426	2.651	0.103
F28O_PREV_OF_ACCIDENT_TRAUMA	Mentioned	7.195	5.574	2.651	0.103
F28P_PREVENTION_OF_TB_LEPRSY	Not mentioned	89.329	94.341	20.145	0.000
F28P_PREVENTION_OF_TB_LEPRSY	Mentioned	10.671	5.659	20.145	0.000
F28Q_PREV_OF_COMMUN_DISEASES	Not mentioned	87.793	89.274	1.305	0.253
F28Q_PREV_OF_COMMUN_DISEASES	Mentioned	12.207	10.726	1.305	0.253
F28R_YOUTH_REPROUCTIVE_HEALTH	Not mentioned	94.907	96.368	3.085	0.079
F28R_YOUTH_REPROUCTIVE_HEALTH	Mentioned	5.093	3.632	3.085	0.079
F28S_OTHER_SERVICE_BY_HEW	Not mentioned	99.838	100.000	1.916	0.166
F28S_OTHER_SERVICE_BY_HEW	Mentioned	0.162	0.000	1.916	0.166
F29_HH_EVER_VISTED_BY_HEW	Yes	54.870	49.148	8.836	0.003
F29_HH_EVER_VISTED_BY_HEW	No	45.130	50.852	8.836	0.003
F31A_IMMUNIZATION	Not mentioned	23.848	37.104	29.156	0.000
F31A_IMMUNIZATION	Mentioned	76.152	62.896	29.156	0.000
F31B_INFO_ON_CHILD_NUTRITION	Not mentioned	53.388	65.611	21.599	0.000
F31B_INFO_ON_CHILD_NUTRITION	Mentioned	46.612	34.389	21.599	0.000
F31C_INFO_ON_DIARRHEA_TRMNT	Not mentioned	86.585	90.799	6.131	0.013
F31C_INFO_ON_DIARRHEA_TRMNT	Mentioned	13.415	9.201	6.131	0.013
F31D_INFOR_ON_PREGNANCY_CARE	Not mentioned	87.263	87.934	0.144	0.704
F31D_INFOR_ON_PREGNANCY_CARE	Mentioned	12.737	12.066	0.144	0.704
F31E_INFORMATION_ON_HIV_AIDS	Not mentioned	87.805	88.839	0.361	0.548
F31E_INFORMATION_ON_HIV_AIDS	Mentioned	12.195	11.161	0.361	0.548
F31F_INFORMATION_ON_HYGIENE	Not mentioned	42.954	44.042	0.168	0.682
F31F_INFORMATION_ON_HYGIENE	Mentioned	57.046	55.958	0.168	0.682
F31G_PROMOTION_PIT_LATRINE	Not mentioned	33.469	31.976	0.353	0.552
F31G_PROMOTION_PIT_LATRINE	Mentioned	66.531	68.024	0.353	0.552
F31H_PROMOTE_LATRINE_USE	Not mentioned	41.057	43.288	0.713	0.398
F31H_PROMOTE_LATRINE_USE	Mentioned	58.943	56.712	0.713	0.398
F31I_PROMOTE_SAFE_WATER_USE	Not mentioned	63.279	68.024	3.481	0.062
F31I_PROMOTE_SAFE_WATER_USE	Mentioned	36.721	31.976	3.481	0.062
F31J_INFOR_ON_FAMILY_PLANNING	Not mentioned	80.488	82.805	1.249	0.264
F31J_INFOR_ON_FAMILY_PLANNING	Mentioned	19.512	17.195	1.249	0.264
F31K_MENTAL_HEALTH	Not mentioned	96.612	97.888	2.101	0.147
F31K_MENTAL_HEALTH	Mentioned	3.388	2.112	2.101	0.147
F31L_PREVENTION_OF_HIV_AIDS	Not mentioned	89.837	95.475	16.011	0.000
F31L_PREVENTION_OF_HIV_AIDS	Mentioned	10.163	4.525	16.011	0.000

F31M_PREVENTION_OF_MALARIA	Not mentioned	89.973	88.839	0.476	0.490
F31M_PREVENTION_OF_MALARIA	Mentioned	10.027	11.161	0.476	0.490
F31N_OTHER	Not mentioned	99.865	99.849	0.006	0.940
F31N_OTHER	Mentioned	0.136	0.151	0.006	0.940
F32_CHECKING_CHILD_AT_BORN	Yes	31.896	26.612	9.085	0.003
F32_CHECKING_CHILD_AT_BORN	No	68.104	73.388	9.085	0.003
F33_RECEIVED_VITAMINA_2MONTH	Yes	55.711	52.646	0.740	0.390
F33_RECEIVED_VITAMINA_2MONTH	No	44.289	47.354	0.740	0.390
F35_WHERE_CHECKUP_TAKEPLACE	Your home	43.823	50.696	9.935	0.042
F35_WHERE_CHECKUP_TAKEPLACE	Other home	0.233	0.000	9.935	0.042
F35_WHERE_CHECKUP_TAKEPLACE	Health post	41.259	33.426	9.935	0.042
F35_WHERE_CHECKUP_TAKEPLACE	Health center	11.888	14.763	9.935	0.042
F35_WHERE_CHECKUP_TAKEPLACE	Hospital	2.797	1.114	9.935	0.042
F39A_EXTRA_AMOUNT_OF_FOOD	Not mentioned	33.100	37.604	1.739	0.187
F39A_EXTRA_AMOUNT_OF_FOOD	Mentioned	66.900	62.396	1.739	0.187
F39B_CARE_ON_DANGER_SIGN	Not mentioned	67.599	69.081	0.198	0.656
F39B_CARE_ON_DANGER_SIGN	Mentioned	32.401	30.919	0.198	0.656
F39C_EXCLUSIVELY_BREASTFEED	Not mentioned	40.793	44.847	1.313	0.252
F39C_EXCLUSIVELY_BREASTFEED	Mentioned	59.207	55.153	1.313	0.252
F39D_FREQ_OF_BREASTFEEDING	Not mentioned	57.809	62.396	1.712	0.191
F39D_FREQ_OF_BREASTFEEDING	Mentioned	42.191	37.604	1.712	0.191
F39E_COMPLETE_BREAST_FEEDING	Not mentioned	71.096	72.980	0.344	0.557
F39E_COMPLETE_BREAST_FEEDING	Mentioned	28.904	27.019	0.344	0.557
F39F_KEEP_BAY_WARM	Not mentioned	78.788	77.159	0.303	0.582
F39F_KEEP_BAY_WARM	Mentioned	21.212	22.841	0.303	0.582
F39G_POSITION_ATTACHMENT	Not mentioned	68.765	68.524	0.005	0.942
F39G_POSITION_ATTACHMENT	Mentioned	31.235	31.476	0.005	0.942
F39H_IMMUNIZE_YOUR_CHILD	Not mentioned	58.974	59.053	0.000	0.982
F39H_IMMUNIZE_YOUR_CHILD	Mentioned	41.026	40.947	0.000	0.982
F39I_LAM	Not mentioned	81.585	81.894	0.013	0.911
F39I_LAM	Mentioned	18.415	18.106	0.013	0.911
F39J_CHILD_TO_SLEEP_UNDER_NET	Not mentioned	88.345	88.022	0.020	0.889
F39J_CHILD_TO_SLEEP_UNDER_NET	Mentioned	11.655	11.978	0.020	0.889
F39K_OTHER_DISCUSSION	Not mentioned	99.767	99.721	0.016	0.900
F39K_OTHER_DISCUSSION	Mentioned	0.233	0.279	0.016	0.900
F40A_EXAMINED_BODY	Not mentioned	27.040	33.705	4.129	0.042
F40A_EXAMINED_BODY	Mentioned	72.960	66.295	4.129	0.042
F40B_CHECKED_BREAST	Not mentioned	49.883	57.103	4.091	0.043
F40B_CHECKED_BREAST	Mentioned	50.117	42.897	4.091	0.043
F40C_CHECKED_FOR_HEAVYBLEED	Not mentioned	82.517	80.780	0.395	0.530
F40C_CHECKED_FOR_HEAVYBLEED	Mentioned	17.483	19.220	0.395	0.530
F40D_COUNSELED_ON_DANGER_SIGNS	Not mentioned	92.541	91.643	0.217	0.641
F40D_COUNSELED_ON_DANGER_SIGNS	Mentioned	7.459	8.357	0.217	0.641
F40E_COUNSELED_ON_FAMILYPLAN	Not mentioned	82.051	84.401	0.769	0.380
F40E_COUNSELED_ON_FAMILYPLAN	Mentioned	17.949	15.599	0.769	0.380
F40F_COUNSELED_ON_NUTRITION	Not mentioned	71.096	71.588	0.023	0.879
F40F_COUNSELED_ON_NUTRITION	Mentioned	28.904	28.412	0.023	0.879
F40G_REFEREED_TO_HEALTH_CENTER	Not mentioned	94.172	91.922	1.551	0.213
F40G_REFEREED_TO_HEALTH_CENTER	Mentioned	5.828	8.078	1.551	0.213
F40H_OTHER_PHYSICAL_CHECK	Not mentioned	99.534	100.000	1.678	0.195
F40H_OTHER_PHYSICAL_CHECK	Mentioned	0.466	0.000	1.678	0.195
F41A_GENERALLY_EXAMINED_BABY	Not mentioned	22.844	27.577	2.335	0.127
F41A_GENERALLY_EXAMINED_BABY	Mentioned	77.156	72.423	2.335	0.127

F41B_WEIGHTED_BABY	Not mentioned	28.438	29.526	0.113	0.737
F41B_WEIGHTED_BABY	Mentioned	71.562	70.474	0.113	0.737
F41C_CHECKED_CORD	Not mentioned	59.207	62.674	0.985	0.321
F41C_CHECKED_CORD	Mentioned	40.793	37.326	0.985	0.321
F41D_COUNSELED_BREASTFEEDING	Not mentioned	67.832	69.638	0.296	0.586
F41D_COUNSELED_BREASTFEEDING	Mentioned	32.168	30.362	0.296	0.586
F41E_OBSERVED_BREASTFEEDING	Not mentioned	75.058	77.437	0.609	0.435
F41E_OBSERVED_BREASTFEEDING	Mentioned	24.942	22.563	0.609	0.435
F41F_COUNSELED_ON_SKIN_TO_SKIN	Not mentioned	89.510	86.630	1.558	0.212
F41F_COUNSELED_ON_SKIN_TO_SKIN	Mentioned	10.490	13.370	1.558	0.212
F41G_CHECKED_DANGER_SIGN	Not mentioned	92.308	91.643	0.117	0.732
F41G_CHECKED_DANGER_SIGN	Mentioned	7.692	8.357	0.117	0.732
F41H_COUNSELED_ON_DANGER_SIGNS	Not mentioned	90.210	91.643	0.484	0.487
F41H_COUNSELED_ON_DANGER_SIGNS	Mentioned	9.790	8.357	0.484	0.487
F41I_REFEREED_TO_HEALTH_CENTER	Not mentioned	96.737	94.708	2.005	0.157
F41I_REFEREED_TO_HEALTH_CENTER	Mentioned	3.263	5.292	2.005	0.157
F41J_OTHER_CHECKING_ON_BABY	Not mentioned	100.000	100.000		
F42A_NOT_KNOWING_WHERE_TO_GO	Not mentioned	96.654	97.480	1.612	0.204
F42A_NOT_KNOWING_WHERE_TO_GO	Mentioned	3.346	2.520	1.612	0.204
F42B_NOT_GETTING_PERMISSION	Not mentioned	96.580	96.590	0.000	0.988
F42B_NOT_GETTING_PERMISSION	Mentioned	3.420	3.410	0.000	0.988
F42C_NOT_GETTING_MONEY	Not mentioned	42.974	42.772	0.011	0.916
F42C_NOT_GETTING_MONEY	Mentioned	57.026	57.228	0.011	0.916
F42D_NOT_HAVING_H_FACILITY	Not mentioned	73.903	75.982	1.550	0.213
F42D_NOT_HAVING_H_FACILITY	Mentioned	26.097	24.018	1.550	0.213
F42E_TRANSPORTATION_PROBLEM	Not mentioned	64.238	65.234	0.292	0.589
F42E_TRANSPORTATION_PROBLEM	Mentioned	35.762	34.766	0.292	0.589
F42F_NOT_WANTING_TO_GO_ALONE	Not mentioned	84.312	85.471	0.705	0.401
F42F_NOT_WANTING_TO_GO_ALONE	Mentioned	15.688	14.529	0.705	0.401
F42G_LACK_OF_FEMALE_HEALTH_P	Not mentioned	90.781	86.657	11.441	0.001
F42G_LACK_OF_FEMALE_HEALTH_P	Mentioned	9.219	13.343	11.441	0.001
F42H_CONCERN_NOT_HAVE_ANY_HP	Not mentioned	95.539	92.513	10.976	0.001
F42H_CONCERN_NOT_HAVE_ANY_HP	Mentioned	4.461	7.487	10.976	0.001
F42I_DUE_TO_HOUSEHOLD_CHORES	Not mentioned	82.082	78.947	4.217	0.040
F42I_DUE_TO_HOUSEHOLD_CHORES	Mentioned	17.918	21.053	4.217	0.040
F42J_OTHER_PROBLEM	Not mentioned	100.000	99.852	1.996	0.158
F42J_OTHER_PROBLEM	Mentioned	0.000	0.148	1.996	0.158
F43A_NOT_KNOWING_WHERE_TO_GO	Not mentioned	97.546	99.185	11.249	0.001
F43A_NOT_KNOWING_WHERE_TO_GO	Mentioned	2.454	0.815	11.249	0.001
F43B_NOT_GETTING_PERMISSION	Not mentioned	95.985	96.294	0.173	0.678
F43B_NOT_GETTING_PERMISSION	Mentioned	4.015	3.706	0.173	0.678
F43C_NOT_GETTING_MONEY	Not mentioned	43.717	44.255	0.079	0.779
F43C_NOT_GETTING_MONEY	Mentioned	56.283	55.745	0.079	0.779
F43D_NOT_HAVING_H_FACILITY	Not mentioned	74.498	77.094	2.474	0.116
F43D_NOT_HAVING_H_FACILITY	Mentioned	25.502	22.906	2.474	0.116
F43E_TRANSPORTATION_PROBLEM	Not mentioned	66.543	67.161	0.116	0.733
F43E_TRANSPORTATION_PROBLEM	Mentioned	33.457	32.839	0.116	0.733
F43F_NOT_WANTING_TO_GO_ALONE	Not mentioned	86.691	87.102	0.099	0.752
F43F_NOT_WANTING_TO_GO_ALONE	Mentioned	13.309	12.898	0.099	0.752
F43G_LACK_OF_FEMALE_HEALTH_P	Not mentioned	97.844	96.071	7.172	0.007
F43G_LACK_OF_FEMALE_HEALTH_P	Mentioned	2.156	3.929	7.172	0.007
F43H_CONCERN_ON_NOT_HAVE_HP	Not mentioned	95.762	93.699	5.741	0.017
F43H_CONCERN_ON_NOT_HAVE_HP	Mentioned	4.238	6.301	5.741	0.017

F43I_DUE_TO_HOUSEHOLD_CHORES	Not mentioned	82.379	79.985	2.527	0.112
F43I_DUE_TO_HOUSEHOLD_CHORES	Mentioned	17.621	20.015	2.527	0.112
F43J_OTHER_PR_TO_GET_ADVICE	Not mentioned	100.000	99.926	0.997	0.318
F43J_OTHER_PR_TO_GET_ADVICE	Mentioned	0.000	0.074	0.997	0.318
F44_ABILITY_TO_PREVENT_CHILD_K	Very well abled	27.435	23.054	15.500	0.001
F44_ABILITY_TO_PREVENT_CHILD_K	Moderately well abled	47.435	46.924	15.500	0.001
F44_ABILITY_TO_PREVENT_CHILD_K	Fairly well abled	23.420	26.612	15.500	0.001
F44_ABILITY_TO_PREVENT_CHILD_K	Not abled at all	1.710	3.410	15.500	0.001

Baseline Balancing Table 3: Categorical Variables, Multiple Records Dataset

Variable	label	Treatment	Control	chi2	p_chi2
E3_SEX	Male	51.301	51.001	0.024	0.876
E3_SEX	Female	48.699	48.999	0.024	0.876
E4_VACCINATION_CARD_FOR_CHILD	Yes, seen	39.331	38.102	1.840	0.606
E4_VACCINATION_CARD_FOR_CHILD	Yes, not available	37.026	38.028	1.840	0.606
E4_VACCINATION_CARD_FOR_CHILD	Never had a card	10.483	9.489	1.840	0.606
E4_VACCINATION_CARD_FOR_CHILD	Never been immunized	13.160	14.381	1.840	0.606
E5A_VACCINES_AT_BIRTH	Yes	85.865	86.957	0.575	0.448
E5A_VACCINES_AT_BIRTH	No	14.135	13.043	0.575	0.448
E5B_VACCINES_AT_6WEEKS	Yes	93.942	92.724	1.351	0.245
E5B_VACCINES_AT_6WEEKS	No	6.058	7.276	1.351	0.245
E5C_VACCINES_AT_10WEEKS	Yes	83.494	83.141	0.051	0.822
E5C_VACCINES_AT_10WEEKS	No	16.506	16.859	0.051	0.822
E5D_VACCINES_AT_14WEEKS	Yes	70.413	71.340	0.236	0.627
E5D_VACCINES_AT_14WEEKS	No	29.587	28.660	0.236	0.627
E5E_9MONTH_MEASLES_VITAMIN_A	Yes	44.074	44.099	0.000	0.990
E5E_9MONTH_MEASLES_VITAMIN_A	No	55.926	55.901	0.000	0.990
E5F_OTHER_VACCINE	Yes	0.088	0.621	4.580	0.032
E5F_OTHER_VACCINE	No	99.912	99.379	4.580	0.032
F1_HAD_ILLNESS_SEEK_TREATMNT	Yes	40.223	43.365	2.734	0.098
F1_HAD_ILLNESS_SEEK_TREATMNT	No	59.777	56.635	2.734	0.098
F3_DID_SELFTREAT_BUYING_DRUGS	Yes	9.982	5.470	8.109	0.004
F3_DID_SELFTREAT_BUYING_DRUGS	No	90.018	94.530	8.109	0.004
F4_HOW_DID_SELF_TREAT	bought drugs from pharmacy/ drug shop	27.778	15.625	3.906	0.419
F4_HOW_DID_SELF_TREAT	bought drugs from a Health Extension Worker	24.074	15.625	3.906	0.419
F4_HOW_DID_SELF_TREAT	used traditional methods	31.481	50.000	3.906	0.419
F4_HOW_DID_SELF_TREAT	bought drugs from a clinic (without examination)	14.815	15.625	3.906	0.419
F4_HOW_DID_SELF_TREAT	other	1.852	3.125	3.906	0.419
F5_SEEK_HEALTH_WORKER	Yes	0.912	1.012	0.230	0.891
F5_SEEK_HEALTH_WORKER	No	26.825	25.632	0.230	0.891
F6_SEEK_GOVT_HOSPITAL	Yes	0.000	0.169	6.337	0.501
F6_SEEK_GOVT_HOSPITAL	No	12.774	11.130	6.337	0.501
F7_SEEK_GOVT_HEALTH_CENTER	Yes	55.839	64.081	8.069	0.005
F7_SEEK_GOVT_HEALTH_CENTER	No	44.161	35.919	8.069	0.005
F8_SEEK_PRIVATE_CLINIC	Yes	1.277	1.349	5.501	0.064

F8_SEEK_PRIVATE_CLINIC	No	51.277	44.351	5.501	0.064
F9_SEEK_NGO_CLINIC	Yes	1.277	1.349	0.232	0.890
F9_SEEK_NGO_CLINIC	No	6.934	6.239	0.232	0.890
F10_SEEK_PHARMACY_DRUGSHOP	Yes	17.701	18.381	0.638	0.888
F10_SEEK_PHARMACY_DRUGSHOP	No	81.022	80.270	0.638	0.888
F11_SEEK_TRADITIONAL_HEALER	Yes	0.730	0.675	0.018	0.991
F11_SEEK_TRADITIONAL_HEALER	No	5.292	5.396	0.018	0.991
F12_SEEK_COMMUNITY_HW	Yes	0.182	0.000	12.161	0.204
F12_SEEK_COMMUNITY_HW	No	32.299	26.138	12.161	0.204