



SMART SURVEY

Kapuri Thakur & Jagjeewan Camp

Nehru Nagar

DELHI

July 2017



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3. ABBREVIATIONS

AAH	Action Against Hunger
AWC	Anganwadi Centre
AWW	Anganwadi Worker
C.I.	Confidence Interval
DLHS	District Level Family and Health Survey
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
HAZ	Height-for-Age z-score
HDI	Human Development Index
HFA	Height-for-Age
HH	Household
ICDS	Integrated Child Development Services
IMR	Infant Mortality Rate
IPCC	In-patient Care Centre
IYCF	Infant & Young Child Feeding
MAM	Moderate Acute Malnutrition
MUAC	Mid-Upper Arm Circumference
NCHS	National Centre for Health Statistics
NFHS	National Family Health Survey
NGO	Non-Governmental Organization
NRC	Nutrition Rehabilitation Centre
ODK	Open Data Kit
OPC	Out-patient Centre
PHC	Primary Health Centre
PLW	Pregnant and Lactation Women
PM	Program Manager
RCH	Reproductive Child Health
RDI	Regular Dietary Intake
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SFC	Supplementary Feeding Centre
SMART	Standardized Assessment for Relief and Transitions
SUW	Severe Underweight

WASH	Water Sanitation and Hygiene
WFH	Weight-for-Height
WHO	World Health Organisation
WHZ	Weight-for-Height z-score

4. EXECUTIVE SUMMARY

Kapuri Thakur and Indira camp is situated in the south district of Delhi. The slums are inhabited by approximately 8,000 people across 5 kms along the railway track. The people living in the area are daily wagers and hawkers in the local markets who share small shanties as a mean of shelter and safe place. Although the area comes under the Delhi Urban Shelter Board but nothing much has been done in the area in terms of development. As per NFHS 4, the prevalence of Global Acute Malnutrition (GAM) in the south district of Delhi is 17.2% and Severe Acute Malnutrition (SAM) is 6.4%. There have not been any studies published on the prevalence of acute malnutrition among children residing in the slums of Delhi, so conducting SMART survey in the area was of prime importance. The overall objective of the survey was to assess the nutritional status of children between 6-59 months in Kapuri Thakur Jagjeewan camp and Indira Camp in Nehru nagar (urban slums) of south district in Delhi. The specific objectives of the survey in the 2 slum pockets of south district of Delhi were:

- To measure the prevalence of acute and chronic malnutrition in children 6-59 months
- To determine the level of retrospective crude death and under 5 mortality rates in the community.
- To assess infant and young child feeding (IYCF) practices
- To assess the prevalence of morbidity (diarrhoea & ARI) in under five children
- To assess water, hygiene and sanitation factors that may contribute to malnutrition in children.

The survey was conducted using simple random sampling as the slum was concentrated in the small geographical area but not in a systematic manner. First, enumeration of all the house hold in the area was conducted followed by selection of house hold using Simple random sampling. A total of 266 children from 6-59 months were measured from 648 households against 257 children from 6-59 months planed in 667 Households.

Summary findings

- A total of 286 children aged 0-59 months were assessed in 648 Households in the survey, among them 266 children were from the age range of 6-59 months.
According to WHO criteria, prevalence of Global Acute Malnutrition (GAM) is 22.2 % (18.5-26.5, 95% C.I.) and prevalence of Severe Acute Malnutrition (SAM) is 5.4 % (3.6 – 8.0 95% C.I.).
- Prevalence of Oedema was at 0.0%. No cases of Oedema were identified.
- The analysis by MUAC showed a prevalence of GAM by MUAC alone of 5.6% (4.0 – 7.9, 95% CI) and SAM of 0.4 % (0.0 – 4.4, 95% CI).
- The prevalence of stunting is 46.5 % (35.0-58.5 95% C.I) and 20.8 % (15.9-26.7, 95% C.I) were severely stunted.

- The underweight prevalence is 48.1% (37.8-58.5, 95% C.I), with 16.8% (12.1-22.8, 95% C.I) severely underweight.
- Crude Death Rate (CDR) was 0.04% per 10,000 populations per day (0.00-0.35 95% CI) and Under 5 Mortality is 0 (0.00-0.00) (95% CI) with 1 design effect.
- The coverage of Immunization (measles aged 9-59 months) by cards was 77 %
- 42% of the house hold collect water from the piped water
- 39% of the caregivers introducing semi-solid food to their 6-8 months old children

5. INTRODUCTION:

India has been witnessing rapid urbanization in recent decades. The urban population of India constitutes 285 million people and is estimated to reach 534 million by 2026. Over one-fourth of the urban population of India today lives in urban slums under inhumane conditions with increased susceptibility to disease and ill health. Current trends in urban poverty suggest that the number of urban poor is set to increase considerably in future in the absence of a well-planned, long-term intervention strategy. Likewise, the national capital is not very far away from its influence. The percentage of Slum dwellers in the capital has increased with time and to >50%. According to the study, titled “A situational analysis of the young child in India”, 52 percent of Delhi’s population resides in urban slums.

Rationale

Among the urban poor households in Delhi about 16% have no access to piped water supply while 75% use private sanitary facility. The inadequacy in availability and use of health infrastructure coupled with poor economic and environmental conditions contribute to the poor health of the urban poor in Delhi. This situation is further worsening by the fact that only 25% of the urban poor children are completely immunized. Dropout and left out rates in childhood immunization are far higher among urban poor households (36.6% and 25.9% respectively), in comparison to the urban average (11.4% and 9.1% respectively). Overall, these factors contribute significantly to the high rates of Neonatal Mortality, Infant mortality and Under-5 year mortality in urban slum communities in Delhi which stand at 39, 35 and 47 per 1000 Live births respectively¹. These are significantly higher than the urban averages. Total fertility rate (TFR) among the urban poor was 4.8% which is twice the urban average of 2.4%² in Delhi. Only one-third of eligible couples among the urban poor use a method of contraception and only 9% use spacing methods. Only one-third (36%) of the mothers among urban poor received the recommended 3 or more antenatal checkups which serve as important contact points to disseminate RCH related information including family planning. Domiciliary delivery is still the norm with a high of 74% taking place at home. Only 29% of the home deliveries were attended by trained personnel.

Further evidence of the rich-poor divide for RCH services and awareness in urban areas in Delhi is evident as children from the fact that poor urban families are thrice as likely to be undernourished as compared to children from rich families. Prevalence of anemia was found to be higher among children belonging to this category. Only 23 percent of the urban poor neonates are breastfed within one hour

¹ NFHS 4 (2015-16)

² State of Urban Health Delhi

of birth. Over two-thirds (68 percent) of the children do not receive complementary foods by 7-9 months of age among the urban poor.

While there exist a variety of policies and programs for slum development, health and nutritional status of women and children, there is a considerable scope for making them more effective in improving health and living conditions of the urban poor. As per NFHS 4, the rates of under nutrition are at alarming level in the national capital territory with southern district is at worrying point of concern. The rates of stunting, underweight and wasting for south district of Delhi are 31.3%, 28.7% and 21.2% which explicitly advocates for an intervention to combat the condition. Alongside, Poor sanitation, in addition to depriving slum-dwellers of their dignity, also poses the perennial risk of exposing the residents especially children to infections and diseases. The slum-free city action plan (SFCAP) submitted by Delhi Shelter Board shows that 56,980 households in the city's slums still defecate in the open. The numbers, apart from being the "ugliest" situation that bring "shame" to the country's capital also advocates for the pressing requisite for a WASH programme in the region. According to article published in Indian express news claimed about 21,778 households without a toilet resides in the South district which is an again a dismal picture of the district.

Moreover, it is essential to dig our self-more into the ground realities because these results cannot be extrapolated to the urban slums as the survey seems to cater mainly to the urban area. Thus to capture the real situation of slums in the south Delhi we need to collect the information of urban dwellers who are residing in the re-settled colonies/Slums of the district.

Objectives of the study:

The overall objective of the survey is to assess the nutritional status of children between 6-69 months in JagJeewan camp and Indira Camp in Nehru nagar (urban slums) of south district in Delhi.

Specific objectives:

- To measure the prevalence of acute and chronic malnutrition in children 6-59 months
- To determine the level of retrospective crude death and under 5 mortality rates in the community.
- To assess infant and young child feeding (IYCF) practices
- To assess the prevalence of morbidity (diarrhoea, fever and cough) in under five children
- To assess water, hygiene and sanitation factors that may contribute to malnutrition in children in 2 slum pockets of south district of Delhi.

6. METHODOLOGY

This nutrition survey was conducted using the SMART (Standardized Monitoring and Assessment of Relief and Transition) methodology. The SMART methodology assesses the nutrition and mortality prevalence among a given population. The method, recognized at all levels of implementation, has provided reliable and context-specific baseline data about the nutritional status of the slum communities, ensuring the representativeness of the sample and the utilization of the results to the entire population of Kapuri Thakur Jagjeevan and Indira Camp.

Target population:

The target population for the anthropometric survey was all children aged between 6 and 59 months because they represent the most vulnerable portion of the population. In the selected households, all eligible children were measured. For mortality, caregiver or head of the households were interviewed.

Sampling

As the survey tool place in slum pockets of south Delhi district, where the households are geographically concentrated in a small area, but not in a systematic manner. Therefore the Nutrition Survey used a simple random sampling methodology. To have the updated list of household an exhaustive house listing of the slum pocket was done through HH enumeration process and thereafter a simple random sampling method was done to select the households. The HH code was given as AAH KT1000, AAH KT 2 000. Here AAH is action against hunger and KT is Kapuri Thakur (slum name) and the first digit is AWC number and beyond that is the HH number as per the enumeration.

Sample Size Calculation

Sample size was calculated for anthropometric as well as mortality indicators and IYCF indicators whereas for data collection of indicators like WASH, prevalence of diarrhoea and Acute Respiratory Infection (ARI), the same sample size of anthropometric indicators was used. The sample size for the nutrition survey was calculated using the ENA 2011 (version - July 9th, 2015).

The following assumptions based on the given context were used to obtain the number of children to survey for anthropometry:

Table 1 Showing assumptions made for calculation of Sample size for acute malnutrition

Parameters	Value	Assumptions
Estimated Prevalence of GAM of the district	21.2%	As per the NFHS 4 of 2015-2016
± Desired precision	5%	Since the GAM prevalence is higher and the data is not available, a precision of ± 5% was chosen as per the guidelines of SMART
Design Effect	1	Design effect is 1 as a standard for SRS
Children to be included for Anthropometric measurements	257	Based on the formula above done in ENA

Table 2 Showing assumptions made for calculation of House Hold for acute malnutrition

Parameters	Value	Assumptions
Average HH Size	5	According to report by Delhi Shelter Board
% Children under-5	10%	Based on the latest census data of 2011, As Per CENSUS 2011, 0-6 Population for south district is 331,043 so under 5 will be $331043 \times \frac{5}{6} = 275870$. This will be 10% of total south district population ($275870/2731929 \times 100$). The all age population for south district is 2731929.
% Non-response Households	3 %	The percentage of non-response chosen is relatively high due to the summer vacations: many families are expected to visit their natives or are employed as casual workers and their houses may be closed.
Households to be included for Anthropometric measurements (according to ENA)	588 households	

Table 3 Showing assumptions made for calculation of sample size for Mortality

Parameters	Value	Assumptions
Crude Death rate	0.66	As per annual report from NTC of Delhi for 2015
± Desired precision	± 0.3	For Mortality indicator, precision will be chosen ± 0.3 as this is a standard precision for the mortality of 0.66/10000 people/ day
Design Effect	1	No previous data available
Recall period	98	From the 13th of March to 18th June 2017 (middle of the data collection)
Average HH Size	5	According to DLHS 3, the average HH size is 5
Non-response rate	3%	The percentage of non-response chosen was relatively high due to the summer vacations: many families are expected to visit their natives or are employed as casual workers and their houses may be closed.
Sample to be included for Mortality	2875	Based on the calculations by ENA
HH to cover for mortality	593	

Table 4 Showing assumptions made for calculation of sample size estimation of IYCF:

Parameters	Value	Assumptions
Estimated prevalence for IYCF indicators	50%	Since the actual prevalence was not available hence 50% was assumed
Precision	10%	A precision of ± 10% was chosen
Design Effect	1	Design effect is 1 as a standard for SRS
Average HH Size	5	According to DLHS 3, the average HH size is 5
% Children 0-23 months	3.3%	Based on the Census 2011 report, the population of 0-48 month children in south district of Delhi state i.e. 0-48 month old population*2/4= 76361 is the population for 0-23 months, 0-23 month population / total population*100 = 76361/ 2267023*100 = 3.3%.
% Non-response Households	3%	The percentage of non-response chosen was relatively high due to the summer vacations: many families are expected to visit their natives or are employed as casual workers and their houses may be closed.
Sample to be included for IYCF assessment where subject is mother of 0 -23 months old child	96	Calculated with help of ENA software
HH to be included for data collection of IYCF indicators	667	

The sample universe for IYCF indicators was 0-23 months so IYCF questions were asked to all caregivers of children aged 0-23 months. The sample size for IYCF indicators was calculated based on an assumed prevalence of 50%, which would give the highest required sample size.

Summary of the samples needed for objectives

Indicator	Minimum sample size required	HH required for data collection
GAM	257 children	588
IYCF	96 children	667

Final Sampling Strategy

To help choosing a sampling strategy, it is necessary to take into account the time it will take for the teams to collect the complete data.

Time to spend per Household for measurement and questionnaire: 30 minutes

Working hours per day (out of transportation): 7h (420 minutes)

Number of HH visited/day/per team: $420/30 = 14$ HH

Total number of HH visited/ day with 5 teams: $14*5 = 70$ HH per day in total

If sampling of 667 HH is chosen. The total duration of data collection will be: $667/70 = 10$ days.

Sample Selection

Using the ENA software, 667 households were randomly drawn from the total households (approx 1700 HHs) of the two slum pockets of south district and divided into 5 teams. Every Household was interviewed for the mortality/WASH/IYCF questionnaire.

Household Selection Techniques

A complete list of households was collected, through enumeration exercise exhaustively covering slum pockets and were given a serial number, as ENA doesn't accept alphanumeric. Later 667 households were randomly selected with the help of ENA 2015 software by putting range from 1 to 1700. The 667 numbers were then randomly generated through the random number table. The survey manager created the final households list as per assigned serial numbers. The field teams then visit selected households to collect data.

Details of proposed and actual sample size achieved

Initially as per the ENA calculation; the survey was planned to cover 667 HHs however, the team was able to collect the information on Anthropometry/WASH & Mortality from 648 households only. A total of 266 children were surveyed from 6-59 months; out of which 100 care givers were surveyed on IYCF and 266 were measured for anthropometry.

Number of households planned	Number of households surveyed	% surveyed	Number of children 6-59 months planned	Number of children 6-59 months surveyed	% surveyed
667	648	97.2%	257	266	103.5%

Survey Teams

The nutrition survey had 5 teams. Each team consisted of 3 members (one team leader and two measurers). The team leader was responsible for coordination of fieldwork, introductions to slum authorities or leader and random selection of households. Survey manager was responsible for daily data entry of the data collected into ENA software, ensuring a high level of data quality and a positive, productive and safe working environment for the team.

The measurer was responsible for determining the date of birth or age of child and confirming it with the calendar of local events or with the help of child immunization card issued by government dispensary, correctly measuring and recording the results of the height, weight and MUAC of children aged 6-59 months. If a SAM case was identified, measurers repeated anthropometry in order to avoid misdiagnosis of the SAM case. In case if a child with oedema was found then the team coordinated with the SMART Survey Manager for confirmation of the case.

The team leader was responsible for taking informed consent (verbal) from the participants. Also, leader dealt with administration of questionnaire which included information about mortality and morbidity. Supervising the anthropometry measurements as well as writing the readings into questionnaire was some of the major tasks. Team leader was also responsible for identification and referring the SAM cases to the Nutrition Rehabilitation and Centre (NRC), Delhi. S/he was also accountable for team's performance as well as coordination with SMART Survey Manager.

One field supervisors was deputed from the administration team for overall supervision and support to the SMART Survey Manager. Data analysis was conducted by SMART Manager using ENA software with support from ACF Advisor in HQ Paris and HoD ACF India.

Survey

The baseline survey was done using simple random sampling and It included following target groups

- All children in the age group of 0-23 months for assessing IYCF practices
- All children from 6 months – 59 months for anthropometric assessment
- 667 Households for assessing mortality and WASH at HH level

Questionnaire

The questionnaire was designed using a standard questionnaire from ENA software for anthropometry and mortality. The questionnaire was divided into three sections as follows:

Section 1: Anthropometry for all children of aged 6-59 months:

Anthropometry:

Indicators such as sex, date of birth, age, height/length, weight, MUAC and bilateral pitting oedema were included. The standard questionnaire from SMART methodology was adopted for this survey. Also, indicators like measure, cloths and referral information added in the questionnaire.

Section 2: WASH:

WASH:

The WASH indicators such as hand washing at critical times, source of drinking water, storage of drinking water and type of infrastructure used for defecation. The standard questionnaire from SMART methodology was adopted for this survey. After training the surveyors on the questionnaire, the tool was pre-tested by survey manager to see its application on the field.

Section 3: IYCF

IYCF

The WHO standard indicators on IYCF from 2007 publication were used to collect data on IYCF. The standard questionnaire was adopted for this survey. After training the surveyors on the questionnaire, the tool was pre-tested by survey manager to see its application on the field.

Training of surveyors:

A -Six days training was conducted by Survey Manager in FHF-AAH Delhi office. The training was conducted for 15 surveyors. The six days training included 4 days of training, two days for standardization tests (as first test was failed by more than 20% of surveyors) and one day of field practical to pilot questionnaire as well as skills of surveyors.

The standardization test was conducted on fourth day of the training where 10 children were invited for the test also the same test was repeated on day 6th of the training. The surveyors were asked to measure each child twice by each surveyor. Based on outcome of the test, main and assistant measurer was selected.

Anthropometric measurement:

Anthropometric measurements were taken for children 6-59 months.

Height/Length: The height/Length was measured (to the nearest 1 mm) using a standard height board. In case of a child below 2 years or less than 87 cm, Length of the children was measured by laying the child on height/Length board i.e. length. In case of a child above 2 years or between 87cm to 110 cm, height was measured while standing on the height board i.e. height. The team leaders were asked to mention in the questionnaire whether height or length was measured by noting H or L.

In case if the child was sick or cannot stand due to some illness that is aging more than 23 months then length was measured noting 'L' in the measure column of questionnaire (column # 9 in anthropometry questionnaire).

Weight: To measure weight of children, 'double weighing technique' was used. First either mother or caretaker was asked to stand on SECA scale. Once the weight of caretaker is measured, button for '2 in 1' measurement was pressed. After '0' appears on screen, child was given to caretaker and instructed them to stand still on the weighing scale. The weight appeared on screen was noted in the questionnaire. The task was repeated for at least three for confirmation purpose.

Mid-Upper Arm Circumference (MUAC): MUAC on the left arm using a MUAC tape (to the nearest 1 mm) calibrated daily with a rod of known circumference.

Bilateral pitting oedema: Only children with bilateral pitting oedema (applying normal thumb pressure for at least 3 seconds to both feet) were to be recorded as having nutritional oedema. No cases of bilateral pitting oedema were identified.

Type of Anthropometric equipment:

Anthropometric measurements were taken on children between 6-59 months of age with the following equipment:

Height cum length boards: wooden height/length boards for measuring children



Figure 1 Height/Length boards used for measurement of height/ length

Weighing Scale: Digital mother & child weighing scale. Brand Name- SECA 874



Figure 2 showing SECA 874 used for measurement of weight

MUAC Tapes: MUAC for children made by Fight Hunger Foundation and ACF India.

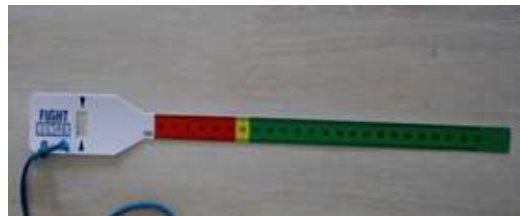


Figure 3 showing MUAC tapes used in this survey

MOYO charts: It was used to determine WHZ score of the children to detect GAM cases



Figure 4 Moyo charts used for WHZ scores

Tablets used for the data collection

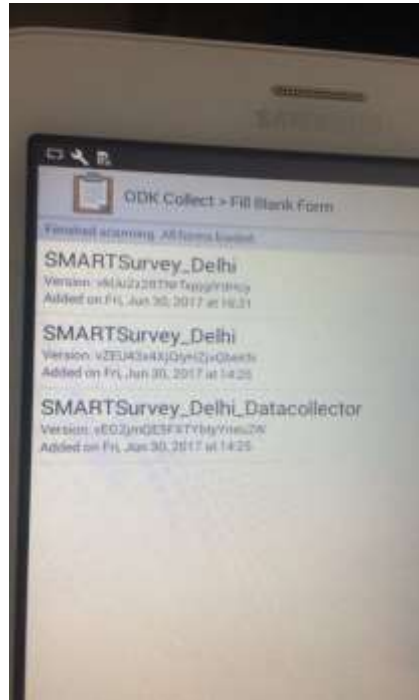


Figure 5 Screenshot of the ODK screen in tablet for data collection

7. RESULTS

7.1 Demographic information:

The sample for the distribution of age and sex was 266 children, including 138 males (51.9%) and 128 females (48.1%). The overall sex ratio was 1.1. The sample consisted of 48.4% of children aged 6 to 29 months and 51.5% of children aged 30-59 months.

Table 5 Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	36	55.4	29	44.6	65	24.4	1.2
18-29	29	45.3	35	54.7	64	24.1	0.8
30-41	30	50.8	29	49.2	59	22.2	1.0
42-53	28	48.3	30	51.7	58	21.8	0.9
54-59	15	75.0	5	25.0	20	7.5	3.0
Total	138	51.9	128	48.1	266	100.0	1.1

Comparison of data against standard curve:

The SMART survey methodology recommends using data with “SMART Flags” unless it is a national survey. This survey covers only a pocket of district, hence SMART flags were used for analysis of the data. Exclusion of z-scores from observed mean SMART flags: WHZ -3 to 3 in the table below:

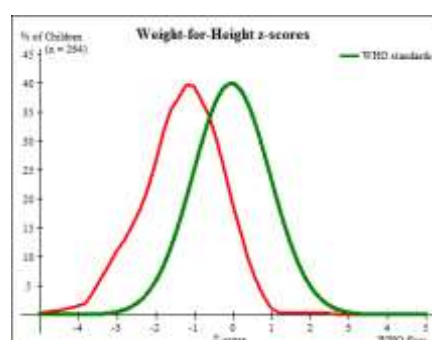


Figure 6 Showing comparison between standard curve and curve representing SMART survey conducted in Kapuri Thakur slum pockets of South district of Delhi.

The survey WHZ distribution showed a normal distribution, and was shifted to the left of the WHO curve. This figure suggests that prevalence of acute malnutrition is higher in the survey area than the reference population. The mean of the WHZ was -1.29 and standard deviation (SD) is 0.95. The SD was within acceptable range of SMART cut-offs i.e. 0.8 to 1.2.

7.2 Prevalence of Acute Malnutrition:

In total, 266 children were measured. From 266 children, 5 children were excluded from the analysis when the SMART flags criterion was applied (incomplete data is excluded). The nutritional analysis was therefore based on a total of 261 children (for WHZ) and was analysed against the WHO 2006 standards. For MUAC, data of 266 children was analysed as SMART flags do not apply to MUAC.

Table 6 Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex using WHO standards 2006

	All n = 261	Boys n = 135	Girls n = 126
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(58) 22.2 % (18.5 - 26.5 95% C.I.)	(31) 23.0 % (18.2 - 28.5 95% C.I.)	(27) 21.4 % (12.0 - 35.3 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >= -3 z-score, no oedema)	(44) 16.9 % (13.1 - 21.4 95% C.I.)	(27) 20.0 % (15.5 - 25.5 95% C.I.)	(17) 13.5 % (8.1 - 21.5 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(14) 5.4 % (3.6 - 8.0 95% C.I.)	(4) 3.0 % (0.7 - 12.4 95% C.I.)	(10) 7.9 % (3.9 - 15.5 95% C.I.)

Table 7 Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 266	Boys n = 138	Girls n = 128
Prevalence of global malnutrition (< 125 mm and/or oedema)	(15) 5.6 % (4.0 - 7.9 95% C.I.)	(4) 2.9 % (1.5 - 5.7 95% C.I.)	(11) 8.6 % (4.9 - 14.7 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(14) 5.3 % (3.5 - 7.9 95% C.I.)	(3) 2.2 % (0.7 - 6.4 95% C.I.)	(11) 8.6 % (4.9 - 14.7 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(1) 0.4 % (0.0 - 4.4 95% C.I.)	(1) 0.7 % (0.1 - 8.2 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

The prevalence of oedema is 0.0 %

According to SMART criteria, prevalence of Global Acute Malnutrition (GAM) is 22.2 % (18.5 – 26.5 95% C.I.) and prevalence of Severe Acute Malnutrition (SAM) is 5.4 % (3.6 – 8.0 95% C.I.). With MUAC the prevalence of GAM was 5.6% (4.0 - 7.9 95% C.I.) and SAM is 0.4 % (0.0 - 4.4 95% C.I.)

To understand the actual burden of GAM in the study area, we combined the cases based on WHZ and MUAC cuts offs (i.e. WHZ <-2SD and MUAC <125 mm). The analysis was done in excel and the findings are illustrated below:

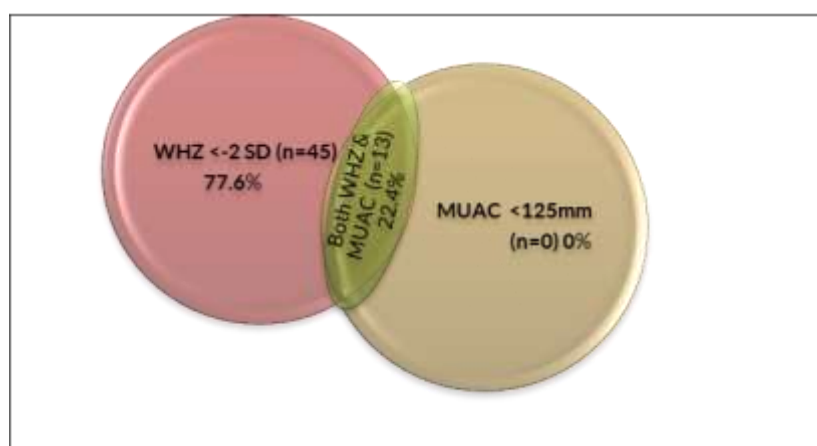


Chart 1 showing overlapping of WHZ <-2SD and MUAC <125mm

Criteria	GAM Prevalence	Number of cases	SAM Prevalence	Number of cases
WHZ and/or Oedema as only criteria (261)	22.2%	58	5.4%	14
MUAC and/or Oedema as only criteria (n=266)	5.6%	15	0.4%	1
Combined prevalence by both criteria (children found GAM with both MUAC and weight for height) /(n=261)	22.2%	58	5.7%	15

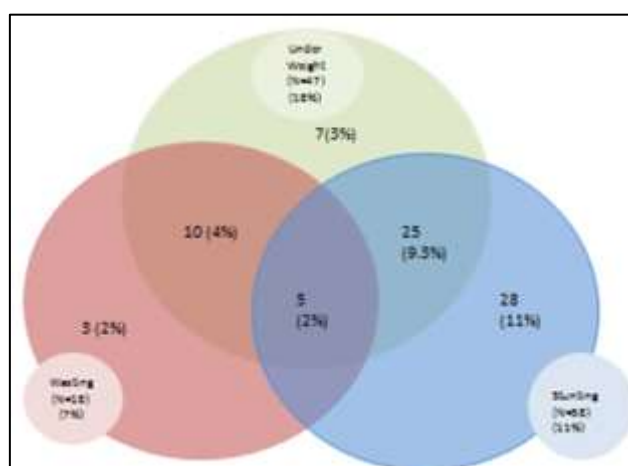
N.B. No Oedema cases found

When data combined for both WHZ and MUAC, a staggering 22.2% (17.2 – 27.3, 95% CI) GAM rate has been derived while the rate of SAM has been found to be 5.7% (2.9 – 8.6, 95% CI). According to WHO classification, the GAM rate is in critical level (>15%) in this surveyed area and poses serious public health attention. There was no Oedema case found during the survey.

Only 22.4% children in the sample were detected as acutely malnourished according both criteria's (WHZ and MUAC). Whereas children classified as wasted by WHZ only criteria were 77.6% and those wasted by MUAC was 0% (see above chart-1). Therefore, it is likely that MUAC based

community screening is not enough to detect all acutely malnourished children eligible for treatment because majority of the children are actually wasted based on WHZ only criteria. In this regard, exploring innovation methods of community detection and screening should be considered.

The use of only MUAC or only WHZ based rates might lead to under estimation of caseload when comes to programming. Data were analysed to get the combined WHZ and MUAC GAM and SAM rates to inform better programming in this area. Thus, combined GAM rate of 22.2% and SAM 5.7% directly classify the situation in Kapuri Thakur and Indira camp as critical need to establish & strengthen CMAM program.



Type of Severe Malnourishment	No. of children	% of children	Explanation
Severe Underweight	47	18	WAZ < -3 SD
Severe Wasting	18	7	WHZ < -3 SD
Severe Stunting	58	22	HAZ < -3 SD
Severe Underweight Only	7	3	WAZ < -3 SD while HAZ & WHZ > / = -3 SD
Severe Wasting Only	3	2	WHZ < -3 SD while HAZ & WAZ > / = -3 SD
Severe Stunting Only	28	11	HAZ < -3 SD while WAZ & WHZ > / = -3 SD
Severe Underweight & Severe Wasting Only	10	4	WAZ & WHZ < -3 SD while HAZ > / = -3 SD
Severe Underweight & Severe Stunting Only	25	9.3	WAZ & HAZ < -3 SD while WHZ > / = -3 SD
Severe Wasting & Severe Stunting Only	0	0	WHZ & HAZ < -3 SD while WAZ > / = -3 SD
Severe Underweight, Severe Wasting, & Severe Stunting together	5	2	WAZ, WHZ, & HAZ < -3 SD

Chart 2 Distribution of data of undernutrition with underweight, wasting, Stunting and all criteria.

The chart 2 is clearly showing that there are 25 children out of 266 suffering from both severe underweight and severe stunting. However out of 266, only 10 children are suffering from severe underweight and severe wasting only (The data analysed includes SMART Flags).

Table 8 Prevalence of acute malnutrition disaggregated by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (≥ -3 and <-2 z-score)		Normal (≥ -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	64	6	9.4	16	25.0	42	65.6	0	0.0
18-29	60	2	3.3	10	16.7	48	80.0	0	0.0
30-41	59	3	5.1	8	13.6	48	81.4	0	0.0
42-53	58	2	3.4	6	10.3	50	86.2	0	0.0
54-59	20	1	5.0	4	20.0	15	75.0	0	0.0
Total	261	14	5.4	44	16.9	203	77.8	0	0.0

There were no children with oedema present in the sample. The data presented in Table 10 suggests that prevalence of GAM is higher in younger children of 6 to 29 months of age (27.4%) when compared to older children of 30-59 months (17.5%).

Table 9 Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	≥ -3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 18 (6.8 %)	Not severely malnourished No. 248 (93.2 %)

The table 9 shows that the prevalence of Oedema is 0% among the survey population. As there was no case of Kwashiorkor seen in the survey.

7.3 Prevalence of Underweight:

Underweight is defined as ‘too thin for his/her age’. The identification of these children is done with measuring their weight and comparing it with their chronological age. Underweight is also called as combination measure of which can occur as a result of “acute and/or chronic malnutrition” and weight for age Z score is calculated to identify the children (WAZ).

In total, 266 children were measured. From 266 children, 4 children were excluded from the analysis when the SMART flags criteria were applied. The nutritional analysis was therefore based on a total of 262 children (for WAZ). Prevalence of global underweight was 48.1% (37.8 – 58.5 95% CI) and severe underweight (SUW) was 16.8 % (12.1 – 22.8 95% CI). Table 10 Prevalence of underweight based on weight-for-age z-scores by sex based on WHO standards 2006

Table 10 Prevalence of underweight based on weight-for-age z-scores (WAZ) disaggregated by sex

	All n = 262	Boys n = 135	Girls n = 127
Prevalence of underweight (<-2 z-score)	(126) 48.1 % (37.8 - 58.5 95% C.I.)	(66) 48.9 % (37.7 - 60.2 95% C.I.)	(60) 47.2 % (37.4 - 57.3 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(82) 31.3 % (21.7 - 42.9 95% C.I.)	(45) 33.3 % (23.1 - 45.4 95% C.I.)	(37) 29.1 % (18.0 - 43.4 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(44) 16.8 % (12.1 - 22.8 95% C.I.)	(21) 15.6 % (11.4 - 20.8 95% C.I.)	(23) 18.1 % (9.9 - 30.9 95% C.I.)

In this survey, 135 children were boys and remaining 127 children were girls. The data shows that the overall prevalence of underweight is higher among boys.

Table 11 Prevalence of underweight disaggregated by age, based on weight-for-age z-scores

		Severe underweight (< -3 z-score)		Moderate underweight (≥ -3 and < -2 z-score)		Normal (≥ -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	65	8	12.3	20	30.8	37	56.9	0	0.0
18-29	61	16	26.2	14	23.0	31	50.8	0	0.0
30-41	59	10	16.9	22	37.3	27	45.8	0	0.0
42-53	57	7	12.3	15	26.3	35	61.4	0	0.0
54-59	20	3	15.0	11	55.0	6	30.0	0	0.0
Total	262	44	16.8	82	31.3	136	51.9	0	0.0

The data presented in table 11 shows that the prevalence of underweight is lower among the younger children (6 to 29 months) i.e. 46.0% as compare to older children (30 to 59 months) i.e. 50%.

7.4 Prevalence of Stunting:

Stunting is defined as “too short for his/ her age”. Stunting is also known as ‘chronic malnutrition’ since growth retardation is an outcome of long term malnutrition and also it is irreversible if child remain malnourished till 2 years of age. Stunting is measured by calculating height/length of children against age in months with the help of Z-score calculation.

In total, 266 children were measured. From 260 children, six children were excluded when the SMART flags criteria was applied. The nutritional analysis was therefore based on a total of 260 children (for HAZ).

Table 12 Prevalence of stunting based on height-for-age z-scores (HAZ) disaggregated by sex based on WHO standard 2006

	All n = 260	Boys n = 134	Girls n = 126
Prevalence of stunting (<-2 z-score)	(121) 46.5 % (35.0 - 58.5 95% C.I.)	(63) 47.0 % (33.2 - 61.3 95% C.I.)	(58) 46.0 % (36.4 - 56.0 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and ≥ -3 z-score)	(67) 25.8 % (18.1 - 35.2 95% C.I.)	(30) 22.4 % (14.4 - 33.0 95% C.I.)	(37) 29.4 % (20.4 - 40.2 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(54) 20.8 % (15.9 - 26.7 95% C.I.)	(33) 24.6 % (16.3 - 35.3 95% C.I.)	(21) 16.7 % (12.4 - 22.0 95% C.I.)

The data presented in Table 12 shows that 46.5% children from these two slums are stunted or chronically malnourished. The data shows that among the sample, more boys are stunted than girls.

Table 13 Prevalence of stunting disaggregated by age based on height-for-age z-scores (HAZ)

		Severe stunting (<-3 z-score)		Moderate stunting (≥ -3 and <-2 z-score)		Normal (≥ -2 z score)	
Age (mo)	Total no.	No.	%	No.	%	No.	%
6-17	65	9	13.8	12	18.5	44	67.7
18-29	61	14	23.0	21	34.4	26	42.6
30-41	57	13	22.8	15	26.3	29	50.9
42-53	57	14	24.6	10	17.5	33	57.9
54-59	20	4	20.0	9	45.0	7	35.0
Total	260	54	20.8	67	25.8	139	53.5

The data from Table 13 shows that the prevalence of stunting is lower among younger age group (6 to 29 months) than older age group (30 to 59 months). The prevalence of stunting is 44.4% among children ages between 6 to 29 months whereas it is 48.5% in age group of 30 to 59 months. Since the stunting is an outcome of prolonged

Table 14 Classification of severity of malnutrition (WHO)

Severity of malnutrition	Prevalence of wasting (<-2 z-scores WFH)*		Prevalence of stunting (<-2 z-scores HFA)		Prevalence of underweight (<-2 z-scores WFA)	
	WHO Threshold	Actual	WHO Threshold	Actual	WHO Threshold	Actual
Acceptable	<5%		<20%		<10%	
Poor	5-9%		20-29%		10-19%	
Serious	10-14%		30-39%		20-29%	
Critical	>=15%	22.2 % (18.5 - 26.5 95% C.I.)	>=40%	46.5 % (35.0 - 58.5 95% C.I.)	>=30%	48.1 % (37.8 - 58.5 95% C.I.)

*Without aggravating factors

The table 14 shows that according to WHO classification of severity of malnutrition, the prevalence of GAM, chronic malnutrition and underweight all falls within ‘critical’ category of malnutrition.

7.5 Infant and Young Child Feeding (IYCF)

The caretakers of 117 children of age between 0 to 23 months were interviewed for the questions related infant and child feeding practices.

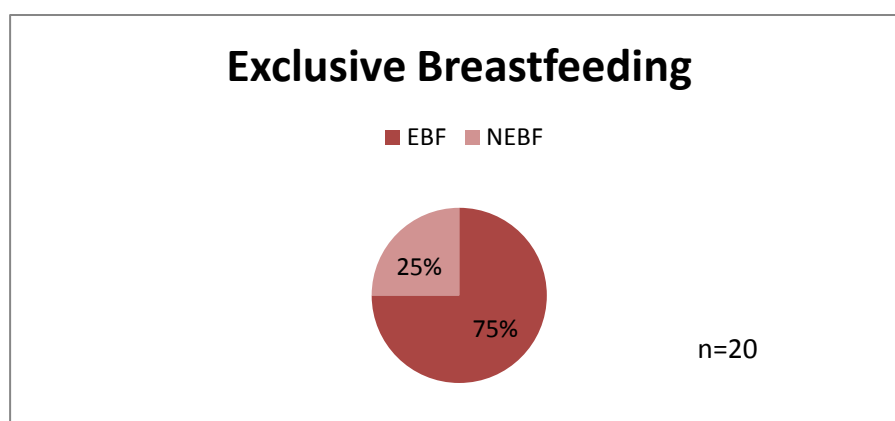


Figure 7 showing percentage of children from 0-5 months of age who were exclusively breastfeed

As shown in the figure above, 75% mothers initiated early breast-feeding to their child i.e. within 1st hour of delivery. According to WHO standards, complimentary feeding is essentially to be introduced from 6 months of age however in the slum, only 39% of the caregivers introduced semi-solid food to their 6 months old children as compare to 45% at the national capital of India.

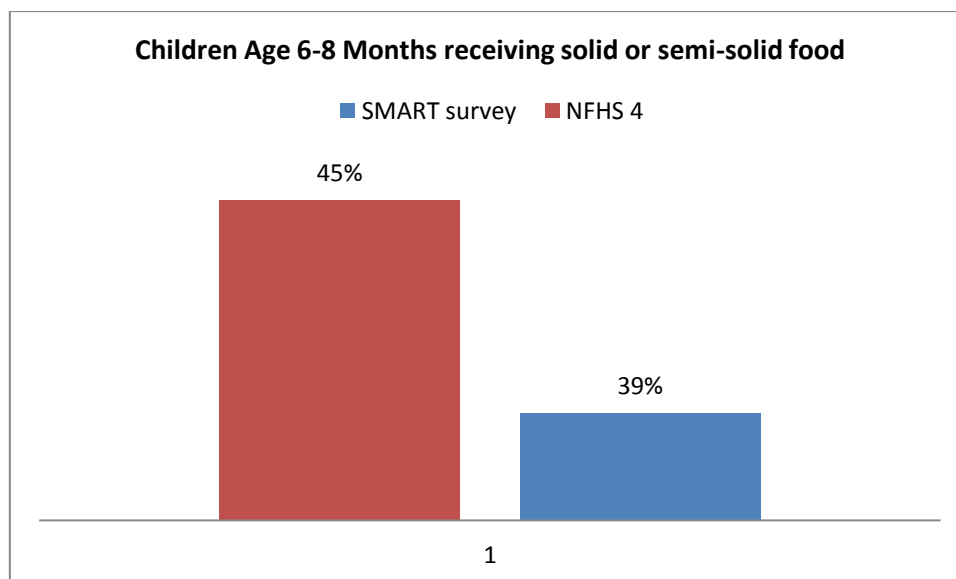


Figure 8 The bar chart showing age when a child was introduced to Complimentary food

A total of 117 children of 0-23 months of age were surveyed to understand the practice of pre-lacteal feed and interestingly it was found that the community is sensitive towards colostrum feeding also known as first vaccine to the child with 88% of care givers feed their child with colostrum just after the child birth. On contrary, the influence of milk substitute like milk powder is also taking over the mind-set of the community being preferred by 10% of urban mothers over any other pre-lacteal feed.

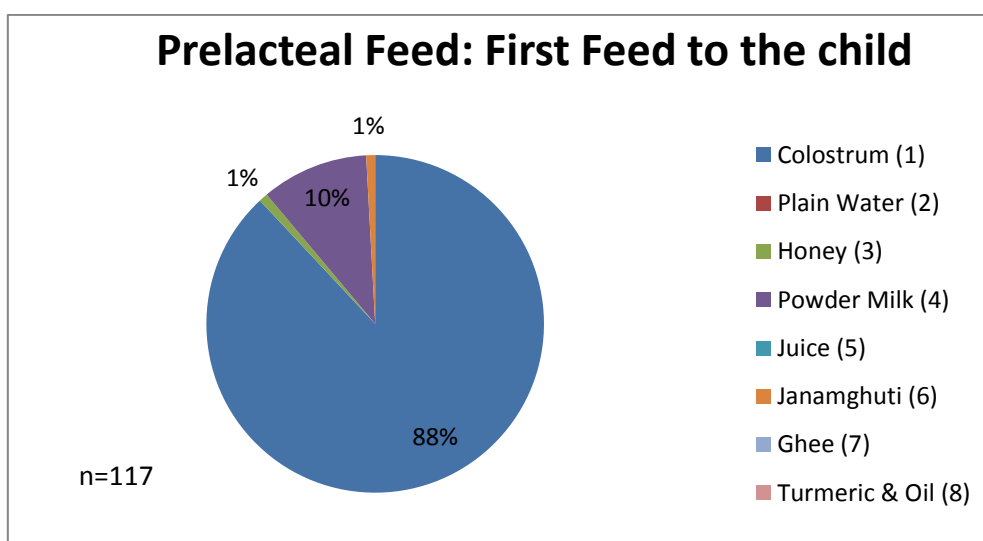


Figure 9 Showing the practices of pre-lacteal feed in the community after the birth of the child

7.6 Water Sanitation and Hygiene (WASH)

WASH being the base of all prevention programme the surveyors collected data on hand-washing methods and use of soap at critical times of hand washing. The data suggests that around 97% responders wash their hands at critical times with soap and water. 2 % use water and mud and 1% wash hands only using water.

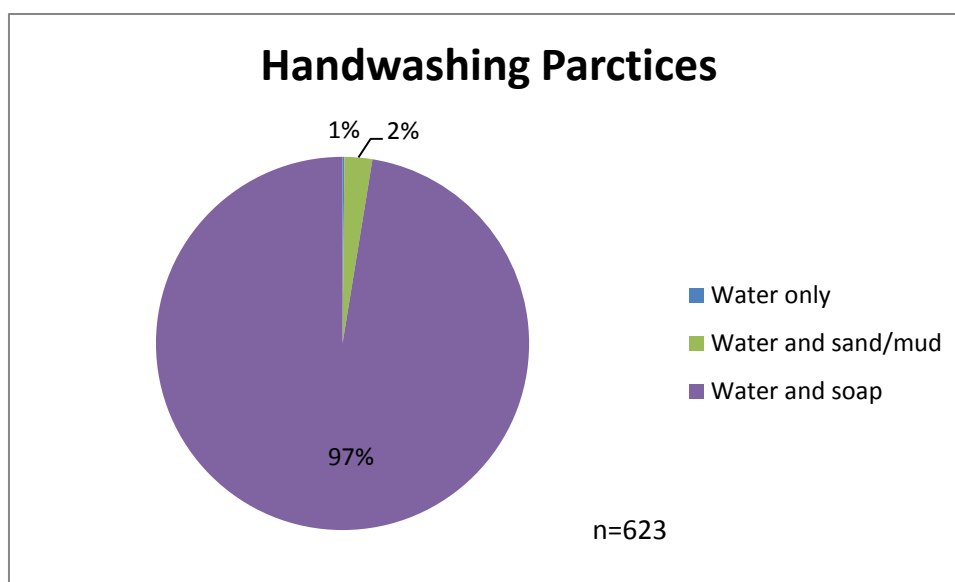


Figure 10 The Pie chart showing the hand washing practices in the slums

In line with Swach Bharat Mission in the country, the community was assessed on the type of toilets used by the people in the community and the results are not very discouraging as only 1% of household out of 623 interviewed goes for open defecation whereas other practice other modalities of toilets to protect environment.

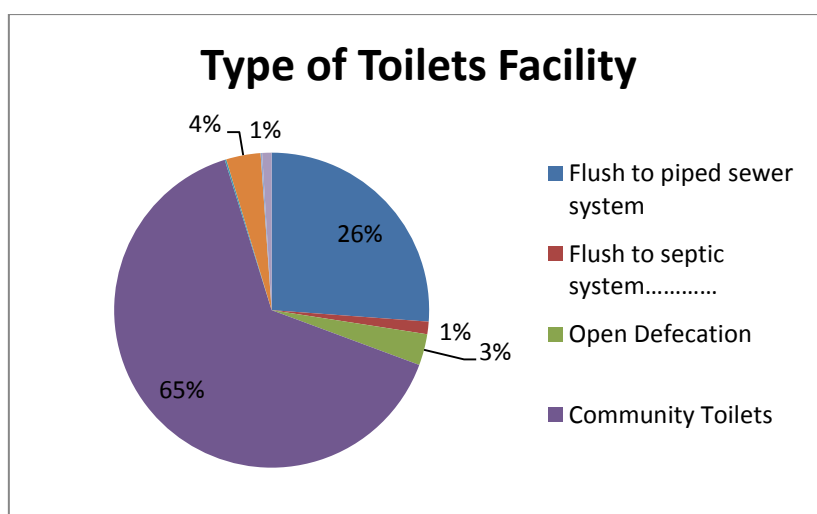


Figure 11 Showing what kind of infrastructure community prefers as a mode for defecation

Alongside, the information on source of drinking water was also collected to understand the prevalence of diseases and source of drinking water. The fallouts from the data collection illustrates clearly that less than 42% of the house hold collect water from the piped water whereas only 5% of the families practice use of bottled water from a local vendor.

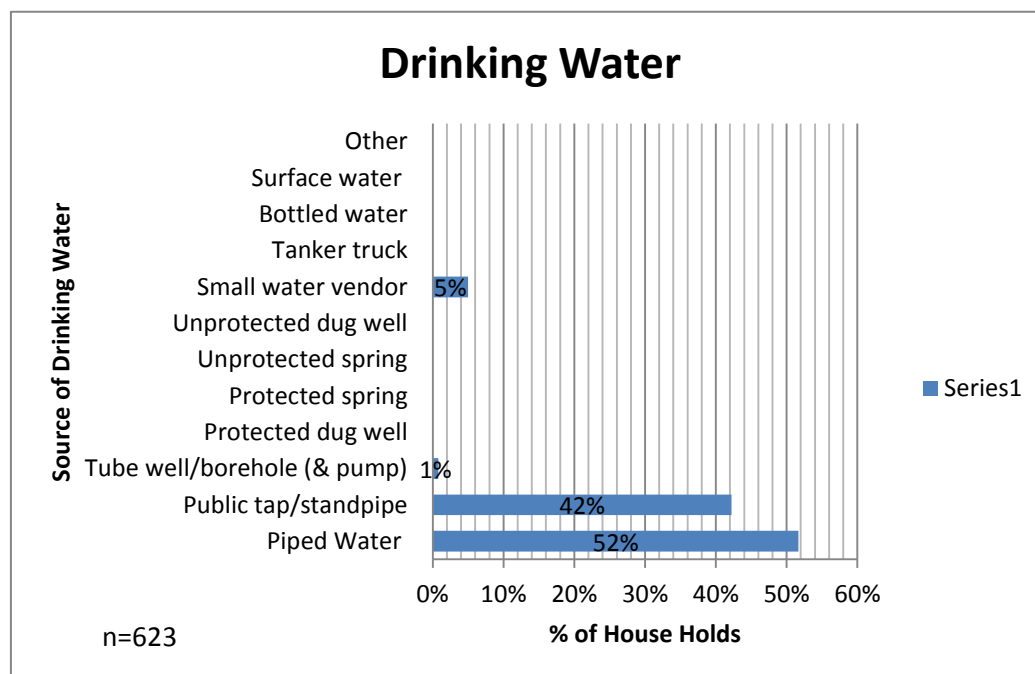


Figure 12 The graph showing source of drinking water practiced at the household level

7.7 Prevalence of Diarrhoea and Measles coverage in the area

Out of 286 care givers of under 5 children only 5% reported that their child has suffered from episodes of diarrhoea in past 15 days. This clearly shows that community is practising safe WASH practices at household level.

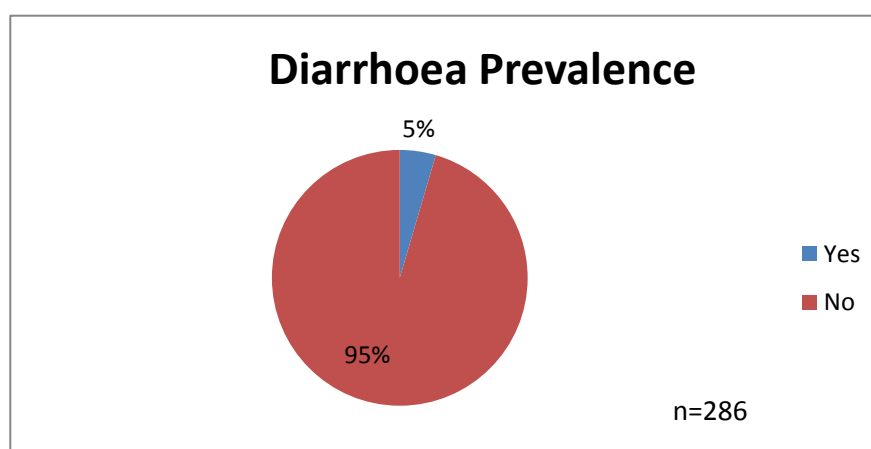


Figure 13 The prevalence of diarrhoea experienced by under 5 children in last 15 days from the day of data collection

However, the coverage of immunization is not satisfactory with only 77% of children below 1years were immunized against measles vaccination (given in the graph below)

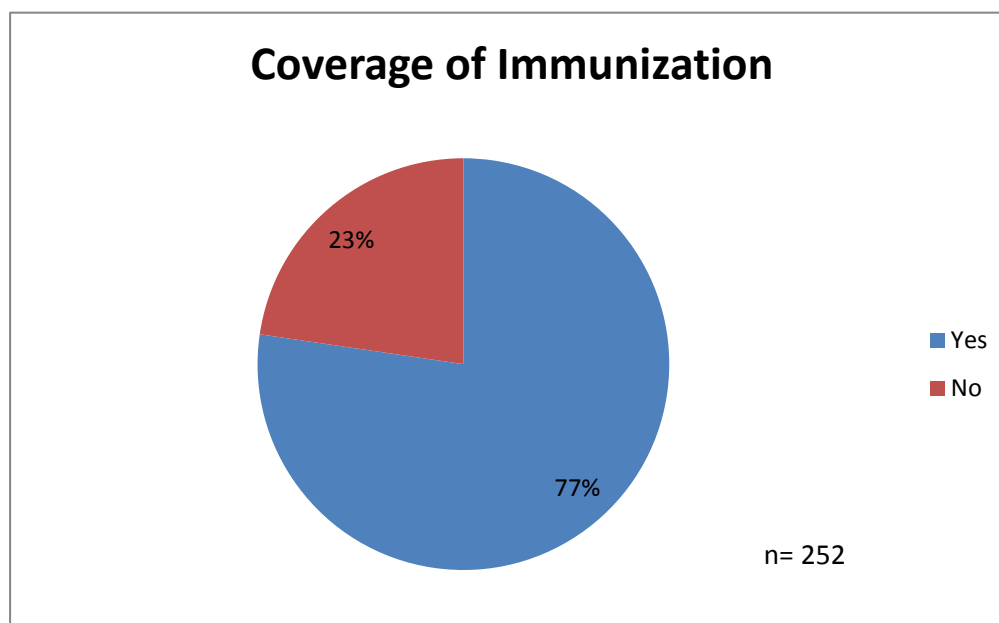


Figure 14 The chart showing coverage of measles vaccine among children of 9-59 months of age

7.8 Mortality results (retrospective over 98 days prior to interview):

In total, 648 households were interviewed, representing 2495 people with 286 children less than five years. As per the analysis, 8.8% children in survey area are under five years of age. Among these 646 surveyed households, 30.4% (197) HHs had at least one child less than five years of age. The average household size is 4.5 people per house. The birth rate of the sampled population was 0.55 per 10,000 people per day. 3.33/10,000/day is in-migration rate whereas 1.61/10000/day is out-migration rate for the survey population. Based on data collected from enumeration on population, around 232 people join the community every day where as 112 people leave this place every day. The age of the population ranges between 1 day to 84 years with more than half (65.4%) of the population being in the reproductive age group (12389 males and 681 females) of 12 to 49 years.

Table 15 Mortality rates

	Total	No. of Deaths	Death rate
Crude Death rate	2899	1	0.04 (0.00-0.35) (95% CI)
Under 5 death rate	243	0	0 (0.00-0.00) (95% CI)

The one death reported in the data occurred was due to illness. The crude death rate for overall population is 0.04 per 10,000 populations per day. Therefore, in slum pocket 2.7 deaths can occur per day.

5 DISCUSSION AND CONCLUSION

The data for SMART survey was collected from two slum pockets of south Delhi district in the 10 days span. All households were visited successfully during the data collection phase.

The NFHS-4 survey was conducted in 2015-16 and presented key findings on the nutritional status of children, women and men across India including NCT of Delhi. The NFHS data reflects status of different indicators including prevalence of malnutrition lowest upto district level. With SMART survey it is possible to get the status on the prevalence at block and below.

The SMART survey supplemented information published in the NFHS-4 and provided important information and in-depth analyses on nutrition data of slums pockets for Delhi which was missing in the published reports. The comparative results of SMART survey data shows that, the prevalence of global acute malnutrition is much higher in the both slum pockets i.e, 22.2% (18.5% – 26.5% 95% CI) than the results for Delhi state from NFHS- 4 The prevalence of GAM is ‘critical’ as per the WHO emergency threshold i.e. more than 15%.

The survey also helped to understand the prevalence of chronic malnutrition in Kapuri Thakur and Indira camp of the district. The prevalence of global stunting is 46.5% (35% - 58.5% 95% CI) in the SMART survey, which is much higher than NFHS- 4 data (27.3%).

The SMART survey in Kapuri Thakur and Indira Camp suggests that prevalence of GAM is 22.2% (18.5%- 26.5% 95% CI) whereas SAM prevalence is 5.4% (3.6%- 8.0% 95% CI). Hence, the burden of malnutrition could be much higher than aggregate prevalence of the national capital. The prevalence of acute malnutrition is significantly different among boys and girls.

Whereas looking at the source of water, the community is using the piped water in the area but it is not within the community. The piped water is available in the community for only bathing purpose only 2hrs in the morning but drinking water the community has to walk up to 1kms from the slum layout to other side of the road to collect water from the piped water by the government supply. The non-availability of drinking water at the household level may push the community to drink water from standing pipe at the household level. This is because when the community were interviewed for the source of drinking water more than 42% answered for the standing piped water as a source of drinking water. Thus, looking at the criticality of the water contamination in the slums area the standing piped water may affect the health of the community especially children <5 years of age.

The outcomes of Infant Young child feeding practices demonstrates that the breastfeeding component in the community is practiced well with 75% of the children 0-5 months were exclusively breastfeed.

However if we compare the data with the latest survey by government of India then rates of exclusive breastfeeding within Delhi state is very poor with only 49.8% of children being exclusively breastfeed.

Alongside, the rates of complementary feeding for the slums are in coherence with the NFHS 4 data which explicitly states that the practices of introducing semi-solid food to the child is compromised which could be the reasons for the children to slip into the window of malnutrition. The age group, which is mostly malnourished as per the survey data, is between 6-59 months of age with 27.4% children suffering from wasting. This is the time when a child starts growing and gains weight. So if the age appropriate diet is not given on time to child then children has tendency to slip into the category of malnutrition.

6 RECOMMENDATIONS AND PRIORITIES

- An integrated Nutrition & Health programme targeting 1000 days of life to combat under nutrition in the area.
- Strong community activities on safe storage and use of drinking water.
- Advocacy for more number of community toilets to limit use of flush attached to regular sewerage drain
- In the absence of treatment for acute malnutrition in the close proximity, the local contact centres in the slum area should be established so that regular information and counselling can be given to caretakers of SAM/ GAM cases.

8. ANNEXURE

Plausibility Report

Plausibility check for: IN_DL_170802.as

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
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Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	0 (1.9 %)

Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	0 (p=0.540)

Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	0 (p=0.404)

Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	0 (5)

Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	2 (11)

Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	0 (7)

Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	

.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	0 (0.95)

Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6
	0	1	3	5	1	(-0.28)

Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6
	0	1	3	5	1	(-0.31)

Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001
	0	1	3	5	0	(p=0.168)

OVERALL SCORE WHZ = 0-9 10-14 15-24 >25 4 %

The overall score of this survey is 4 %, this is excellent.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 0 %

Anthropometric Indices likely to be in error (-3 to 3 for WHZ, -3 to 3 for HAZ, -3 to 3 for WAZ, from observed mean - chosen in Options panel - these values will be flagged and should be excluded from analysis for a nutrition survey in emergencies. For other surveys this might not be the best procedure e.g. when the percentage of overweight children has to be calculated):

Line=25/ID=1: WHZ (-5.203), HAZ (-5.401), WAZ (-6.193)

Line=53/ID=1: WHZ (-5.686), Weight may be incorrect

Line=69/ID=2: HAZ (-5.614), WAZ (-4.986), Age may be incorrect

Line=93/ID=1: HAZ (-5.182), Age may be incorrect

Line=122/ID=2: HAZ (1.191), Age may be incorrect

Line=154/ID=1: WHZ (2.102), Height may be incorrect

Line=161/ID=1: HAZ (-5.654), Height may be incorrect

Line=164/ID=1: WHZ (-4.605), Height may be incorrect

Line=210/ID=1: HAZ (5.197), WAZ (1.388), Age may be incorrect

Line=263/ID=1: WHZ (-4.380), WAZ (-5.055), Weight may be incorrect

Percentage of values flagged with SMART flags: WHZ: 1.9 %, HAZ: 2.3 %, WAZ: 1.5 %

Age distribution:

Month 6 :
Month 7 : #####
Month 8 : #####
Month 9 : #####
Month 10 : #####
Month 11 : #####
Month 12 : #####
Month 13 : #####
Month 14 : #####
Month 15 : #####
Month 16 : ##
Month 17 : #####
Month 18 : ###
Month 19 : #####
Month 20 : #####
Month 21 : #####
Month 22 : #####
Month 23 : #####
Month 24 : #####
Month 25 : #####
Month 26 : #####
Month 27 : #####
Month 28 : ##
Month 29 : #####
Month 30 : #####
Month 31 : #####
Month 32 : #
Month 33 : #####
Month 34 :
Month 35 : #####
Month 36 : #####
Month 37 : ##
Month 38 : #####
Month 39 :
Month 40 : #####
Month 41 : #####

Month 42 : #####
 Month 43 : #####
 Month 44 : #####
 Month 45 : ###
 Month 46 : #####
 Month 47 : #####
 Month 48 : #####
 Month 49 : #
 Month 50 : #####
 Month 51 :
 Month 52 : #####
 Month 53 : #####
 Month 54 : ###
 Month 55 : #####
 Month 56 :
 Month 57 : #
 Month 58 : #####
 Month 59 : #####
 Month 60 : #####

Age ratio of 6-29 months to 30-59 months: 0.94 (The value should be around 0.85).:
 p-value = 0.404 (as expected)

Statistical evaluation of sex and age ratios (using Chi squared statistic):

Age cat.	mo.	boys	girls	total	ratio boys/girls

6 to 17	12	36/32.0 (1.1)	29/29.7 (1.0)	65/61.7 (1.1)	1.24
18 to 29	12	29/31.2 (0.9)	35/29.0 (1.2)	64/60.2 (1.1)	0.83
30 to 41	12	30/30.3 (1.0)	29/28.1 (1.0)	59/58.3 (1.0)	1.03
42 to 53	12	28/29.8 (0.9)	30/27.6 (1.1)	58/57.4 (1.0)	0.93
54 to 59	6	15/14.7 (1.0)	5/13.7 (0.4)	20/28.4 (0.7)	3.00

6 to 59	54	138/133.0 (1.0)	128/133.0 (1.0)		1.08

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.540 (boys and girls equally represented)

Overall age distribution: p-value = 0.573 (as expected)

Overall age distribution for boys: p-value = 0.943 (as expected)

Overall age distribution for girls: p-value = 0.136 (as expected)

Overall sex/age distribution: p-value = 0.095 (as expected)

Digit preference Weight:

Digit .0 : #####

Digit .1 : #####

Digit .2 : #####

Digit .3 : #####

Digit .4 : #####

Digit .5 : #####

Digit .6 : #####

Digit .7 : #####

Digit .8 : #####

Digit .9 : #####

Digit preference score: 5 (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.823

Digit preference Height:

Digit .0 : #####

Digit .1 : #####

Digit .2 : #####

Digit .3 : #####

Digit .4 : #####

Digit .5 : #####

Digit .6 : #####

Digit .7 : #####

Digit .8 : #####

Digit .9 : #####

Digit preference score: 11 (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.001 (significant difference)

Digit preference MUAC:

Digit .0 : #####
Digit .1 : #####
Digit .2 : #####
Digit .3 : #####
Digit .4 : #####
Digit .5 : #####
Digit .6 : #####
Digit .7 : #####
Digit .8 : #####
Digit .9 : #####

Digit preference score: 7 (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.152

Evaluation of Standard deviation, Normal distribution, Skewness and Kurtosis using the 3 exclusion (Flag) procedures

.	no exclusion	exclusion from	exclusion from
.	reference mean	observed mean	
.	(WHO flags)	(SMART flags)	
WHZ			
Standard Deviation SD:	1.07	1.01	0.95
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	23.3%	22.7%	
calculated with current SD:	26.5%	24.3%	
calculated with a SD of 1:	25.1%	24.1%	

HAZ

Standard Deviation SD: 1.45 1.45 1.31

(The SD should be between 0.8 and 1.2)

Prevalence (< -2)

observed:	47.0%	47.0%	46.5%
calculated with current SD:	45.1%	45.1%	44.0%
calculated with a SD of 1:	42.9%	42.9%	42.2%

WAZ

Standard Deviation SD: 1.15 1.12 1.07

(The SD should be between 0.8 and 1.2)

Prevalence (< -2)

observed:	48.5%	48.3%	48.1%
calculated with current SD:	48.1%	47.5%	46.9%
calculated with a SD of 1:	47.8%	47.2%	46.7%

Results for Shapiro-Wilk test for normally (Gaussian) distributed data:

WHZ	p= 0.000	p= 0.049	p= 0.042
HAZ	p= 0.003	p= 0.003	p= 0.023
WAZ	p= 0.592	p= 0.949	p= 0.478

(If $p < 0.05$ then the data are not normally distributed. If $p > 0.05$ you can consider the data normally distributed)

Skewness

WHZ	-0.61	-0.30	-0.28
HAZ	0.31	0.31	0.08
WAZ	-0.19	-0.04	-0.01

If the value is:

-below minus 0.4 there is a relative excess of wasted/stunted/underweight subjects in the sample

-between minus 0.4 and minus 0.2, there may be a relative excess of wasted/stunted/underweight subjects in the sample.

-between minus 0.2 and plus 0.2, the distribution can be considered as symmetrical.

-between 0.2 and 0.4, there may be an excess of obese/tall/overweight subjects in the sample.

-above 0.4, there is an excess of obese/tall/overweight subjects in the sample

Kurtosis

WHZ	1.38	0.38	-0.31
HAZ	1.30	1.30	-0.71
WAZ	0.31	-0.14	-0.47

Kurtosis characterizes the relative size of the body versus the tails of the distribution. Positive kurtosis indicates relatively large tails and small body. Negative kurtosis indicates relatively large body and small tails.

If the absolute value is:

-above 0.4 it indicates a problem. There might have been a problem with data collection or sampling.

-between 0.2 and 0.4, the data may be affected with a problem.

-less than an absolute value of 0.2 the distribution can be considered as normal.

Test if cases are randomly distributed or aggregated over the clusters by calculation of the Index of Dispersion (ID) and comparison with the Poisson distribution for:

WHZ < -2: ID=1.56 (p=0.168)

WHZ < -3: ID=0.46 (p=0.808)

GAM: ID=1.56 (p=0.168)

SAM: ID=0.46 (p=0.808)

HAZ < -2: ID=2.67 (p=0.020)

HAZ < -3: ID=2.04 (p=0.069)

WAZ < -2: ID=2.27 (p=0.045)

WAZ < -3: ID=2.33 (p=0.040)

Subjects with SMART flags are excluded from this analysis.

The Index of Dispersion (ID) indicates the degree to which the cases are aggregated into certain clusters (the degree to which there are "pockets"). If the ID is less than 1 and $p > 0.95$ it indicates that the cases are UNIFORMLY distributed among the clusters. If the p value is between 0.05 and 0.95 the cases appear to be randomly distributed among the clusters, if ID is higher than 1 and p is less than 0.05 the cases are aggregated into certain cluster (there appear to be pockets of cases). If this is the case for Oedema but not for WHZ then aggregation of GAM and SAM cases is likely due to inclusion of oedematous cases in GAM and SAM estimates.

Are the data of the same quality at the beginning and the end of the clusters?

Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one cluster per day is measured then this will be related to the time of the day the measurement is made).

Time	SD for WHZ															
point	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3
01: 0.64 (n=06, f=0)																
02: 1.42 (n=06, f=0)	#####															
03: 1.87 (n=06, f=1)	#####															
04: 1.04 (n=06, f=0)	#####															
05: 0.86 (n=06, f=0)	###															
06: 0.73 (n=06, f=0)																
07: 0.50 (n=06, f=0)																
08: 1.21 (n=06, f=0)	#####															
09: 1.02 (n=06, f=0)	#####															
10: 0.52 (n=06, f=0)																
11: 1.09 (n=06, f=0)	#####															
12: 0.72 (n=06, f=0)																
13: 0.82 (n=06, f=0)	#															
14: 0.41 (n=06, f=0)																
15: 0.89 (n=06, f=0)	####															
16: 1.08 (n=06, f=0)	#####															
17: 1.01 (n=06, f=0)	#####															
18: 0.39 (n=05, f=0)																
19: 0.70 (n=05, f=0)																
20: 1.08 (n=05, f=0)	#####															
21: 0.71 (n=05, f=0)																
22: 0.57 (n=05, f=0)																
23: 1.41 (n=05, f=0)	#####															
24: 0.90 (n=05, f=0)	####															
25: 0.39 (n=05, f=0)																
26: 0.85 (n=05, f=0)	##															
27: 1.79 (n=05, f=1)	#####															
28: 0.94 (n=05, f=0)	#####															
29: 1.41 (n=05, f=1)	#####															
30: 0.67 (n=05, f=0)																

31: 2.03 (n=05, f=1) #####
 32: 0.52 (n=05, f=0)
 33: 0.63 (n=05, f=0)
 34: 0.77 (n=05, f=0)
 35: 1.20 (n=05, f=0) #####
 36: 1.32 (n=05, f=0) #####
 37: 0.91 (n=04, f=0) #####
 38: 1.03 (n=04, f=0) #####
 39: 0.59 (n=04, f=0)
 40: 1.31 (n=04, f=0) #####
 41: 0.53 (n=04, f=0)
 42: 1.21 (n=04, f=0) #####
 43: 1.84 (n=04, f=1) #####
 44: 1.44 (n=04, f=0) #####
 45: 0.84 (n=04, f=0) ##
 46: 1.24 (n=04, f=0) #####
 47: 1.19 (n=04, f=0) #####
 48: 0.39 (n=04, f=0)
 49: 1.67 (n=04, f=0) #####
 50: 1.18 (n=04, f=0) #####
 51: 0.86 (n=03, f=0) OO
 52: 0.14 (n=03, f=0)
 53: 1.30 (n=03, f=0) OOOOOOOOOOOOOOOOOOOOOO
 54: 0.61 (n=02, f=0)
 55: 0.31 (n=02, f=0)

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Analysis by Team

Team	1	2	3	4	5
n =	55	44	54	54	59
Percentage of values flagged with SMART flags:					
WHZ:	0.0	4.5	1.9	1.9	1.7
HAZ:	5.5	4.5	0.0	1.9	0.0

WAZ: 3.6 2.3 0.0 1.9 0.0

Age ratio of 6-29 months to 30-59 months:

0.67 1.32 1.16 0.93 0.84

Sex ratio (male/female):

1.62 0.91 0.86 1.00 1.11

Digit preference Weight (%):

.0 : 13 7 6 4 12

.1 : 7 9 7 11 12

.2 : 11 20 7 9 15

.3 : 5 11 15 17 3

.4 : 7 18 7 15 12

.5 : 16 11 15 2 10

.6 : 9 5 9 7 7

.7 : 7 2 15 13 8

.8 : 16 2 9 9 12

.9 : 7 14 9 13 8

DPS: 12 20 11 15 11

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Digit preference Height (%):

.0 : 27 11 9 19 12

.1 : 11 5 11 11 22

.2 : 7 9 17 19 8

.3 : 5 5 11 9 12

.4 : 11 11 11 6 7

.5 : 20 16 6 19 8

.6 : 5 9 13 6 8

.7 : 9 11 11 9 10

.8 : 2 16 9 4 0

.9 : 2 7 2 0 12

DPS: 25 13 13 21 17

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Digit preference MUAC (%):

.0 : 18 25 2 4 10

.1 : 7 7 7 7 10

.2 : 5 11 15 4 17

.3 : 11 9 15 9 5

.4 : 2 5 11 13 5

.5 :	27	14	6	9	12
.6 :	4	9	13	19	8
.7 :	2	2	11	9	10
.8 :	11	2	11	11	7
.9 :	13	16	9	15	15
DPS:	25	22	13	15	12

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Standard deviation of WHZ:

SD	1.02	1.28	1.08	0.98	1.00
----	------	------	------	------	------

Prevalence (< -2) observed:

%	23.6	18.2	33.3		25.4
---	------	------	------	--	------

Prevalence (< -2) calculated with current SD:

%	25.7	31.6	30.5		27.4
---	------	------	------	--	------

Prevalence (< -2) calculated with a SD of 1:

%	25.3	27.1	29.1		27.3
---	------	------	------	--	------

Standard deviation of HAZ:

SD	1.73	1.55	1.25	1.39	1.36
----	------	------	------	------	------

observed:

%	41.8	54.5	42.6	55.6	42.4
---	------	------	------	------	------

calculated with current SD:

%	47.1	48.0	41.9	44.1	43.8
---	------	------	------	------	------

calculated with a SD of 1:

%	45.0	46.9	40.0	41.9	41.6
---	------	------	------	------	------

Statistical evaluation of sex and age ratios (using Chi squared statistic) for:

Team 1:

Age cat.	mo.	boys	girls	total	ratio boys/girls

6 to 17	12	9/7.9 (1.1)	2/4.9 (0.4)	11/12.8 (0.9)	4.50
18 to 29	12	5/7.7 (0.7)	6/4.8 (1.3)	11/12.4 (0.9)	0.83
30 to 41	12	6/7.5 (0.8)	5/4.6 (1.1)	11/12.1 (0.9)	1.20
42 to 53	12	10/7.3 (1.4)	7/4.5 (1.5)	17/11.9 (1.4)	1.43
54 to 59	6	4/3.6 (1.1)	1/2.2 (0.4)	5/5.9 (0.9)	4.00

6 to 59	54	34/27.5 (1.2)	21/27.5 (0.8)	1.62
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The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.080 (boys and girls equally represented)

Overall age distribution: p-value = 0.583 (as expected)

Overall age distribution for boys: p-value = 0.665 (as expected)

Overall age distribution for girls: p-value = 0.394 (as expected)

Overall sex/age distribution: p-value = 0.058 (as expected)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls

6 to 17	12	6/4.9 (1.2)	7/5.3 (1.3)	13/10.2 (1.3)	0.86
18 to 29	12	4/4.8 (0.8)	8/5.2 (1.5)	12/10.0 (1.2)	0.50
30 to 41	12	6/4.6 (1.3)	4/5.0 (0.8)	10/9.6 (1.0)	1.50
42 to 53	12	3/4.5 (0.7)	4/5.0 (0.8)	7/9.5 (0.7)	0.75
54 to 59	6	2/2.2 (0.9)	0/2.5 (0.0)	2/4.7 (0.4)	

6 to 59	54	21/22.0 (1.0)	23/22.0 (1.0)		0.91

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.763 (boys and girls equally represented)

Overall age distribution: p-value = 0.493 (as expected)

Overall age distribution for boys: p-value = 0.854 (as expected)

Overall age distribution for girls: p-value = 0.300 (as expected)

Overall sex/age distribution: p-value = 0.166 (as expected)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls

6 to 17	12	7/5.8 (1.2)	8/6.7 (1.2)	15/12.5 (1.2)	0.88
18 to 29	12	6/5.7 (1.1)	8/6.6 (1.2)	14/12.2 (1.1)	0.75
30 to 41	12	6/5.5 (1.1)	7/6.4 (1.1)	13/11.8 (1.1)	0.86

42 to 53	12	5/5.4 (0.9)	5/6.3 (0.8)	10/11.7 (0.9)	1.00
54 to 59	6	1/2.7 (0.4)	1/3.1 (0.3)	2/5.8 (0.3)	1.00

6 to 59	54	25/27.0 (0.9)	29/27.0 (1.1)		0.86

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.586 (boys and girls equally represented)

Overall age distribution: p-value = 0.470 (as expected)

Overall age distribution for boys: p-value = 0.846 (as expected)

Overall age distribution for girls: p-value = 0.682 (as expected)

Overall sex/age distribution: p-value = 0.400 (as expected)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls

6 to 17	12	4/6.3 (0.6)	7/6.3 (1.1)	11/12.5 (0.9)	0.57
18 to 29	12	10/6.1 (1.6)	5/6.1 (0.8)	15/12.2 (1.2)	2.00
30 to 41	12	5/5.9 (0.8)	7/5.9 (1.2)	12/11.8 (1.0)	0.71
42 to 53	12	5/5.8 (0.9)	7/5.8 (1.2)	12/11.7 (1.0)	0.71
54 to 59	6	3/2.9 (1.0)	1/2.9 (0.3)	4/5.8 (0.7)	3.00

6 to 59	54	27/27.0 (1.0)	27/27.0 (1.0)		1.00

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 1.000 (boys and girls equally represented)

Overall age distribution: p-value = 0.849 (as expected)

Overall age distribution for boys: p-value = 0.468 (as expected)

Overall age distribution for girls: p-value = 0.745 (as expected)

Overall sex/age distribution: p-value = 0.239 (as expected)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls

6 to 17	12	10/7.2 (1.4)	5/6.5 (0.8)	15/13.7 (1.1)	2.00
18 to 29	12	4/7.0 (0.6)	8/6.3 (1.3)	12/13.3 (0.9)	0.50
30 to 41	12	7/6.8 (1.0)	6/6.1 (1.0)	13/12.9 (1.0)	1.17
42 to 53	12	5/6.7 (0.7)	7/6.0 (1.2)	12/12.7 (0.9)	0.71
54 to 59	6	5/3.3 (1.5)	2/3.0 (0.7)	7/6.3 (1.1)	2.50

6 to 59	54	31/29.5 (1.1)	28/29.5 (0.9)	1.11
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The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.696 (boys and girls equally represented)

Overall age distribution: p-value = 0.984 (as expected)

Overall age distribution for boys: p-value = 0.450 (as expected)

Overall age distribution for girls: p-value = 0.867 (as expected)

Overall sex/age distribution: p-value = 0.265 (as expected)

Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one cluster per day is measured then this will be related to the time of the day the measurement is made).

Team: 1

Time	SD for WHZ															
point	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3
01: 1.32 (n=05, f=0)	#####															
02: 0.14 (n=02, f=0)																
03: 1.55 (n=03, f=0)	#####															
15: 0.82 (n=03, f=0)	#															
17: 0.71 (n=02, f=0)																
19: 0.25 (n=02, f=0)																
21: 0.23 (n=02, f=0)																
34: 0.10 (n=02, f=0)																
36: 1.91 (n=02, f=0)	#####															
37: 1.65 (n=02, f=0)	#####															
38: 0.99 (n=02, f=0)	#####															
42: 0.91 (n=02, f=0)	#####															

44: 1.37 (n=02, f=0) #####
 47: 0.73 (n=02, f=0)

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 2

Time	SD for WHZ																
point	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	
01: 0.45 (n=05, f=0)																	
03:						3.93								(n=02,			f=1)
#####																	
05: 0.50 (n=02, f=0)																	
07: 0.43 (n=02, f=0)																	
24: 0.07 (n=02, f=0)																	
31:						3.35								(n=02,			f=1)
#####																	
33: 0.97 (n=03, f=0) #####																	
34: 0.53 (n=03, f=0)																	
35: 0.24 (n=02, f=0)																	
44: 0.96 (n=02, f=0) #####																	
47: 0.25 (n=02, f=0)																	

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 3

Time	SD for WHZ															
point	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3
01: 0.98 (n=06, f=0) #####																
03: 0.63 (n=02, f=0)																
08: 1.11 (n=02, f=0) #####																
09: 0.97 (n=04, f=0) #####																

10: 0.81 (n=03, f=0) #
 12: 0.92 (n=02, f=0) #####
 14: 1.33 (n=03, f=1) #####
 15: 1.24 (n=02, f=0) #####
 16: 1.92 (n=02, f=0) #####
 18: 0.67 (n=02, f=0)
 38: 0.55 (n=02, f=0)
 39: 1.17 (n=02, f=0) #####

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 4

Time	SD for WHZ															
point	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3
01: 0.67 (n=06, f=0)																
08: 0.48 (n=02, f=0)																
09: 0.27 (n=03, f=0)																
18: 0.96 (n=02, f=0) #####																
19: 0.54 (n=02, f=0)																
20: 1.01 (n=03, f=0) #####																
21: 0.17 (n=02, f=0)																
22: 0.39 (n=02, f=0)																
23: 1.95 (n=03, f=0) #####																
24: 0.83 (n=02, f=0) #																
26: 0.47 (n=03, f=0)																
29:						2.52										
															(n=02,	f=1)
#####																
30: 0.43 (n=02, f=0)																
33: 1.09 (n=02, f=0) #####																

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 5

Time	SD for WHZ
point	0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.60 (n=06, f=0)	
03: 0.14 (n=02, f=0)	
04: 1.24 (n=03, f=0)	#####
05: 0.44 (n=02, f=0)	
06: 0.15 (n=02, f=0)	
10: 1.06 (n=02, f=0)	#####
12: 1.12 (n=04, f=0)	#####
13: 0.70 (n=03, f=0)	
14: 1.41 (n=04, f=0)	#####
16: 0.57 (n=02, f=0)	
17: 0.14 (n=02, f=0)	
25: 0.76 (n=02, f=0)	
33: 0.95 (n=02, f=0)	#####
37: 0.58 (n=02, f=1)	
38: 0.15 (n=02, f=0)	
50: 0.02 (n=02, f=0)	

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

(for better comparison it can be helpful to copy/paste part of this report into Excel)

Random Number table for assigning household

Range: 1 to 1549, Number: 667

775	1192	886	108	505	86	1056	1248	388	427	1011	
1142	1162	233	114	362	139	285	1179	138	914	1171	185
161	512	228	840	849	271	72	1122	804	1161	1300	757
282	950	230	10	689	1129	171	1392	364	850	41	879
1306	565	526	679	1048	395	738	1243	550	1113	941	
1045	180	503	473	576	1277	759	112	317	165	643	123
1127	1267	324	260	1217	1066	1063	1249	1290	589	798	
1302	379	596	1102	1387	928	946	1110	296	820	447	649
164	423	1389	242	1130	261	374	970	275	209	1386	
1346	1366	1352	630	805	1213	113	647	131	1123	762	450
658	743	1244	662	494	396	1067	617	695	206	5	229
101	196	262	891	782	24	1400	168	1222	878	1148	
1271	699	338	717	33	1023	943	800	1282	482	351	227
174	498	478	1256	1350	1383	1001	530	1326	1101	770	
1210	682	347	184	853	1295	1131	203	687	955	1305	
1357	856	1088	1091	386	624	1006	1375	1201	1	570	219
1378	1005	146	1332	631	1209	1219	279	240	6	592	664
484	497	957	88	1016	1314	1153	1167	313	500	436	166
751	1025	1132	727	28	1220	118	793	1287	468	237	595
160	272	741	355	414	528	600	852	1204	1107	786	437
587	421	953	674	361	714	399	1283	866	612	819	767
1215	868	1000	855	1126	57	109	122	1281	258	68	686
945	1279	1147	1177	56	116	1257	1055	1083	725	769	
1057	63	887	697	453	917	1071	611	718	1380	256	
1175	402	851	352	403	103	931	1191	910	938	82	688
1111	435	922	822	1329	37	942	496	19	360	1364	702
569	1120	345	298	20	90	1009	511	859	715	328	722
411	779	1202	580	1342	579	556	954	300	1024	299	195
222	1272	884	312	175	583	616	349	823	419	1251	
1339	898	625	1354	694	807	1303	1239	489	1185	527	226
1236	660	221	80	1365	720	1351	367	341	1164	217	385
517	491	1108	17	18	1047	903	1263	960	1276	1221	330
149	277	1240	615	1328	829	15	685	1288	983	143	642

220	1381	987	1373	1077	333	306	588	249	344	25	198
250	601	1395	836	1166	1252	883	1369	906	190	620	540
305	602	654	529	486	610	534	1376	975	597	1182	445
1199	392	167	607	980	810	234	554	995	1058	614	140
952	876	1194	268	358	488	38	1064	622	1197	1266	921
1087	719	189	1278	703	835	629	627	912	976	639	
1264	255	1312	543	370	327	792	1207	451	989	990	350
457	1145	1246	363	463	893	472	212	81	784	1106	
1322	480	1059	202	1031	1235	483	502	79	1237	749	522
52	1224	1345	604	378	439	681	1014	85	244	1409	
1255	1133	1385	553	797	357	899	1333	635	1099	1178	121
493	274	896	1293	986	1151	466	393	516	1327	567	170
758	267	442	455	335	998	651	48	1394	1308	981	429
632	1205	881	1042	640	740	218	832	1032	978	1356	
1060	1317	1190	560	1051	535	26	1270	181	127	125	311
1052	864	270	102	1227	92	1103	671	215	291	1141	
1050	839	1226	538	334	672	947	1407	100	13	197	223
192	816	1229	628	1109	158	1017	557	934	60	545	
1408	1311	609	174	766	834	1015	487	1176	266	1476	42
277	1178	113	1005	226	355	1050	825	401	547	743	853
513	155	484	376	682	166	808	358	1231	33	1104	655
863	307	519	755	606	100	1058	1135	566	1448	847	
1266	548	501	1369	965	1201	542	1121	374	1221	878	247
106	1321	311	1147	523	879	1019	801	942	201	525	464

List of selected HH

	S.NO:	HH NUMBER	NAME OF THE HEAD OF THE HH	NO. OF U5	TOTAL FS
Team 1	57	AAHKT2100	Bhupendra Kamad	-	5
	58	AAHKT2102	Sulendar Kamad	1	3
	59	AAHKT2104	Rajkumar Mandal	-	2
	60	AAHKT2105	Satish	-	1
	63	AAHKT2108	Sameem	1	3
	65	AAHKT2116	Rajesh	-	3
	68	AAHKT2124	Hemant	-	4
	70	AAHKT2131	Moshujul	-	2
	72	AAHKT2137	Manor Singh	-	4
	75	AAHKT2143	Rekha Devi	-	4
	76	AAHKT2151	Kacho Devi	-	7
	79	AAHKT2156	Shanti	-	3
	80	AAHKT2157	Vijay	-	1
	81	AAHKT2159		-	2
	82	AAHKT2160	Kavita	-	2
	83	AAHKT2161	Geeta Mandal	-	5
	85	AAHKT2163	Vikki	-	6
	86	AAHKT2164	Ravindra Sharma	1	6
	88	AAHKT2169	Saraswati	-	4
	90	AAHKT2172	Ramesh	-	2

	91	AAHKT2175	Anand Mandal	-	4
	92	AAHKT2176	Govind Mandal	-	5
	95	AAHKT2181	Disha Devi	2	4
	98	AAHKT2184	Vanadana	2	4
	100	AAHKT2186	SukUnd Mandal	-	5
	102	AAHKT2192		2	6
	103	AAHKT2193	Govind Mandal	-	4
	106	AAHKT2207	Pooja Sahul	2	4
Team 2	107	AAHKT2210	Deepanshu	-	1
	109	AAHKT2213	Gudiya Rani	-	2
	110	AAHKT2214	Birendra Kamad	-	3
	111	AAHKT2217	Mahesh Kumar	-	4
	113	AAHKT2222	Naresh Mandal	1	6
	115	AAHKT2224	Sujita Devi	-	6
	117	AAHKT2230	Shankula Devi	-	6
	118	AAHKT2231	Ram shobit]	-	3
	119	AAHKT2236	Sanjay	-	5
	120	AAHKT2237	Lala Mandal	-	4
	121	AAHKT2238	Anjali	-	1
	125	AAHKT2247		-	7
	126	AAHKT2249	Alpna Mandal	1	7
	127	AAHKT2250	Dev Chandan Kamad	-	1
	131	AAHKT2264		-	5

	132	AAHKT2265	Ashok Kumar	-	5
	134	AAHKT2272	Rajmati	-	3
	137	AAHKT2280		-	2
	138	AAHKT2281	Sarita Devi	-	2
	139	AAHKT2283		-	2
	141	AAHKT2287	Anil Kumar	-	3
	142	AAHKT2288	Md. Munna	-	8
	144	AAHKT2291	Krishna	-	2
	147	AAHKT2296	Arti Kamad	1	3
	150	AAHKT2304	Sanjay Kamad	-	1
	156	AAHKT2320	Jai Narayan	-	4
	157	AAHKT2323	Rajini Gupta	-	5
	159	AAHKT2327	Manoj Kamad	1	5
Team 3	162	AAHKT2331	Sunil	2	5
	163	AAHKT2333	Brahma Dev Kamad	-	1
	164	AAHKT2334	Ratni Devi	-	4
	165	AAHKT2335	Dharamdra Bhandari	2	4
	169	AAHKT2340	Beju	-	9
	171	AAHKT2343	Ajay	-	1
	173	AAHKT2350	Kishan	-	2
	176	AAHKT2353	Amar	-	4
	177	AAHKT2357	Satendra Kumar	-	2
	178	AAHKT2358	Ramudgar	-	4

	179	AAHKT2360	Hari Kamad	-	2
	180	AAHKT2361	Shobha Lal	-	8
	181	AAHKT2365	Shambhu	-	5
	182	AAHKT2366	Santosh kumar	-	2
	185	AAHKT2370	Dharmendra Kumar	-	4
	186	AAHKT2371	Arvind	1	3
	189	AAHKT2374	BABU RAM	1	4
	192	AAHKT2380	RANJEET	-	2
	193	AAHKT2382	TRIBHUVAN	1	3
	194	AAHKT2383	LAL BABU	-	2
	200	AAHKT2396	VINOD KUMAR KAMAD	2	5
	202	AAHKT2401	KAMAL KAMAD	-	2
	203	AAHKT2406	CHANDESHWAR	2	4
	205	AAHKT2409	DIL BAHADUR	-	5
	206	AAHIC3006	HARAN MANDAL	-	1
	208	AAHIC3014	BHAGWAN MANDAL	-	2
	209	AAHIC3019	SATUSH MANDAL	-	4
	211	AAHIC3023	PARIMAL MANDAL	-	2
Team 4	212	AAHIC3024	BABLU MANDAL	-	4
	213	AAHIC3025	DHANIRAM	-	2
	215	AAHIC3029	LAKSHMAN MANDAL	1	5
	220	AAHIC3037	DIJEN MANDAL	-	5
	221	AAHIC3038	GUMESTHA MANDAL	-	7

226	AAHIC3050	RATAN MANDAL	-	25
227	AAHIC3053	UDAY MANDAL	-	4
228	AAHIC3054	NIMAI MANDAL	-	5
229	AAHIC3056	BHEEM	-	4
230	AAHIC3062	ARTHU MNDAL	-	20
234	AAHIC3071	GOVIND	-	2
236	AAHIC3073	KALAMATI	2	4
237	AAHIC3074	ANAND KUMAR	-	6
238	AAHIC3078	PINKI DEVI	1	6
239	AAHIC3079	RAMAWATI	-	5
241	AAHIC3082	SAVITA	2	2
245	AAHIC3091	ASHWATHAMA	-	4
248	AAHIC3096	HARPAL	2	5
252	AAHIC3105	BHOLA	-	15
254	AAHIC3107	UMESH MAHARAJ	-	3
255	AAHIC3112		-	-
260	AAHIC3121	PATA DEVI	1	8
261	AAHIC3124	RAMPAL	-	5
263	AAHIC3138	BIJAL KUMAR	2	6
266	AAHIC3145		-	4
267	AAHIC3146	NARAYAN	-	3
268	AAHIC3147	BABLU	-	4
270	AAHIC3150	RATAN MANDAL	-	1

Team 5	271	AAHIC3155	KAMDEV MANDAL	1	7
	272	AAHIC3157	PURKHEET MANDAL	-	6
	273	AAHIC3159	PADAV MANDAL	1	5
	276	AAHIC3163	VIREN MANDAL	1	4
	278	AAHIC3168	YUVRAJ MANDAL	-	4
	279	AAHIC3169	DILIP MANDAL	-	5
	281	AAHIC3173	SANJAY	-	5
	284	AAHIC3182			
	286	AAHIC3189	PAPPU MANDAL	1	5
	287	AAHIC3193	VIBHUTI MANDAL	-	5
	288	AAHIC3199	BISHU MANDAL	-	6
	290	AAHIC3205		-	4
	291	AAHIC3209	RIYASAT	-	5
	292	AAHIC3210	AMZAD	1	3
	294	AAHIC3212	LOTAN	3	25
	295	AAHIC3214		-	4
	296	AAHIC3218		-	6
	298	AAHIC3222	RAM	-	2
	300	AAHIC3228	DEEPAK	1	5
	303	AAHIC3232	BANNO	-	12
	305	AAHIC3235		-	4
	306	AAHIC3244	NEERAJ	-	3
	310	AAHIC3251	CHANGU	2	4

	311	AAHIC3253	ANIL	-	2
	313	AAHIC3256	HARI SINGH	2	5
	315	AAHIC3260	ARJUN	-	4
	316	AAHIC3261	SHESH PAL	-	2
	317	AAHIC3262	MUKESH	-	5
Team 1	319	AAHIC3265	PINTU	-	4
	320	AAHIC3266	SHAMSHER	-	5
	321	AAHIC3269	GAINDALAL	-	1
	322	AAHIC3272	RINKU	-	4
	323	AAHIC3273	RAJKUMAR	-	3
	326	AAHIC3278			
	327	AAHIC3279	RAMESH	-	6
	328	AAHIC3281	VIKAS	-	3
	329	AAHIC3283	RAJESH	1	3
	330	AAHIC3286	NIRMAN MANDAL	1	6
	332	AAHIC3288	SAGMA	-	3
	334	AAHIC3291	RAJKUMAR	-	6
	336	AAHIC3295	VIKAS	-	6
	337	AAHIC3298	MANISH CHNADRA	-	5
	338	AAHIC3299	BRIJPAL	-	4
	340	AAHIC3302	VIJAY	1	3
	341	AAHIC3303	DHARAMVEER	1	3
	344	AAHIC3310	SANJAY	-	7

	345	AAHIC3311	SATTU	-	4
	346	AAHIC3315	DEEPAK RAI	-	4
	348	AAHIC3320	GAGENDRA	-	6
	351	AAHIC3325	MOTILAL	-	12
	355	AAHIC3336	LILUA	2	5
	358	AAHIC3344	MITAL MANDAL	-	11
	359	AAHIC3351	VISHWANATH	-	3
	362	AAHIC3355		-	3
	363	AAHIC3356	RANJEET	-	4
	365	AAHIC3365	SURAJ PAL	2	7
Team 2	367	AAHIC3367	MUSKESH	-	6
	368	AAHIC3370	RAMU	1	3
	369	AAHIC3372	RAHUL	-	3
	370	AAHIC3375	SACHIN	1	7
	372	AAHIC3380	RAJKUMAR	-	4
	373	AAHIC3381	SOORAJ	-	2
	374	AAHIC3382	IRSHAD	-	5
	376	AAHIC3386	HARDEV	-	9
	379	AAHIC3394	JITENDER	-	15
	380	AAHIC3395	ARJUN	-	4
	382	AAHIC3397	NARAYAN MANDAL	-	3
	383	AAHIC3398		-	4
	385	AAHIC3403	KRISHANAN	1	4

	386	AAHIC3404	AJAY MANDAL	-	4
	387	AAHIC3405		-	4
	390	AAHIC3411	AMAR SINGH	-	4
	392	AAHIC2007	RAMLATAN		5
	395	AAHIC2010			2
	396	AAHIC2013	VIRU BHADUR	1	3
	397	AAHIC2015	PINTU	1	3
	398	AAHIC2017	SATPAL	2	4
	399	AAHIC2018	SURENDAR	1	8
	400	AAHIC2021	SHRI KISHAN	2	6
	402	AAHIC2023	AAMOD	2	4
	403	AAHIC2025	BASATI	2	7
	404	AAHIC2026	BRIJESH KUMAR	1	3
	405	AAHIC2027	RAM SAJWAL		6
	407	AAHIC2030	SALEMUNGAM	3	5
Team 3	408	AAHIC2031	LATA	3	5
	411	AAHIC2040	SHIBU SINGH	1	5
	413	AAHIC2043	SURESH KUMAR		7
	414	AAHIC2045	SAROJNI		3
	416	AAHIC2049	SIKANDRA		3
	417	AAHIC2050	ANITA		5
	419	AAHIC2052	RANJEET		5
	422	AAHIC2055	RAM KHILANVAN		5

	423	AAHIC2056	SATYANARYAN		3
	424	AAHIC2057	BALKISHAN	1	5
	425	AAHIC2059	KIRAN		5
	428	AAHIC2065	SUNIL		4
	429	AAHIC2066	VIJAY KUMAR		4
	430	AAHIC2067	SOHAN LAL	2	11
	433	AAHIC2074	AKHILESH	1	3
	434	AAHIC2075	DHARMENDAR		6
	436	AAHIC2077	CHANDRESH	1	7
	437	AAHIC2078	BURI SINGH		5
	439	AAHIC2083	ANGAT		2
	440	AAHIC2086	BHAI LAL		6
	441	AAHIC2087	PURANMASI		2
	442	AAHIC2088	BHUPENDER SINGH'	2	4
	446	AAHIC2096	RAMESANJIVAN		3
	448	AAHIC2099	SHALIK		3
	450	AAHIC2102	SATROHAN'	1	3
	451	AAHIC2103	NEELAM	1	4
	452	AAHIC2105	ASHOK	1	3
	453	AAHIC2106	SURENDRA	1	3
Team 4	454	AAHIC2108	SOBRAN		5
	455	AAHIC2111	RADHE SHYAM		5
	456	AAHIC2113	RAJENDAR		5

458	AAHIC2115	KALI THAKUR		4
460	AAHIC2117	DEEPAK KUMAR		4
461	AAHIC2122	DEELIP	1	4
462	AAHIC2123	SOURAV	1	8
464	AAHIC2127	JAGROOP		3
466	AAHIC2130	SAROJ		6
469	AAHIC2137	GANGA SAGAR	1	3
470	AAHIC2139	SHANKAR		4
471	AAHIC2141	RAJU		5
472	AAHIC2142	PAWAN		6
474	AAHIC2144	DHOLA		5
477	AAHIC2149	SANDEEP		3
478	AAHIC2153	RAMACHAL		6
479	AAHIC2156	SUSHEELA		4
480	AAHIC2157	RAKHI		5
483	AAHIC2160	SAVITA		3
485	AAHIC2162(A)	PARDEEP	0	6
486	AAHIC2167	PARTIMA		5
488	AAHIC2171	RAMPARKASH		5
489	AAHIC2172	ARJUN	2	4
494	AAHIC2179	SHIV PARSAD		5
495	AAHIC2180	RAJENDRA		7
497	AAHIC2182	ANIL	1	3

	498	AAHIC2188	GUNJAN		2
	500	AAHIC2193	SHJHA MISHRA	1	7
Team 5	501	AAHIC2195	RAJESH KR		4
	503	AAHIC2197	SHRI NATH		2
	504	AAHIC2198	JAI KARAN	2	7
	505	AAHIC2200	SURYA BHAN SINGH	2	7
	506	AAHIC2202	SUNITA	1	5
	507	AAHIC2204	GOPU		6
	508	AAHIC2205	RAJESH	1	5
	509	AAHIC2206	SHIV NATH		2
	510	AAHIC2207	MATHIYA		3
	512	AAHIC2209	HARI PRASAD		1
	514	AAHIC2212			5
	517	AAHIC2220	RAM SAGAR		6
	518	AAHIC2223	SURAJ		4
	519	AAHIC2224	NAVENDRA	1	10
	521	AAHIC2227	KARAN SINGH	3	6
	522	AAHIC2230	LALI	2	5
	523	AAHIC2231	JAGDISH		6
	524	AAHIC2233	MANOJ		5
	526	AAHIC2237	RAJNI	3	5
	528	AAHIC2241	HARI RAM	2	4
	529	AAHIC2242	DUDH NATH		2

	532	AAHIC2246	CHARANDAS		3
	535	AAHIC1 004	RADHE SHYAM	1	3
	537	AAHIC1 008	SWARTH RAM	1	7
	539	AAHIC1 010	GAMMU YADAV		5
	540	AAHIC1 013	ROHIT GUPTA	3	5
	541	AAHIC1 014	CHHOTE LAL		5
	543	AAHIC1 017	RAMURTI	1	7
Team 1	546	AAHIC1 022	SURENDER	1	5
	548	AAHIC1 025	SATISH		2
	549	AAHIC1 027	KISHAN KUMAR		8
	550	AAHIC1 028	LATURI		5
	551	AAHIC1 029	SANDEEP	2	4
	553	AAHIC1 032	RESHMA		4
	554	AAHIC1 040	RAMURTI	2	9
	555	AAHIC1 044	RAM PAL		4
	556	AAHIC1 045	SHRI CHAND		4
	557	AAHIC1 047	ZAFAR KHAN		7
	558	AAHIC1 054	RAMESH		2
	561	AAHIC1 060	RAJESH	2	5
	563	AAHIC1 062	DHARMENDER	1	3
	564	AAHIC1 064	KAALI CHARAN		6
	565	AAHIC1 065	GAJRAJ GUPTA		4
	566	AAHIC1 066	SAFIQ		8

	567	AAHIC1 068	SHIV PAL GUPTA	1	5
	568	AAHIC1 069	JAG PRASAD GUPTA	1	9
	571	AAHIC1 073	BHARTI	1	7
	572	AAHIC1 074	VIJAY KUMAR	1	7
	576	AAHIC1 083	DEV NAATH	1	7
	578	AAHIC1 086	MOHAN PRASAD	2	4
	581	AAHIC1 093	DINESH MANDAL	1	4
	582	AAHIC1 094	JAMNA PRASAD		5
	588	AAHIC1 105	MANORANJAN		1
	589	AAHIC1 108	VIKAS MANDAL	1	7
	591	AAHIC1 112	ASHOK		3
	593	AAHIC1 116			2
	595	AAHIC1 120	JYOTSHNA MANDAL		2
Team 4	596	AAHIC1 123	SANTOSH		6
	597	AAHIC1 124	ANIL MANDAL		2
	598	AAHIC1 125	BASU MANDAL	1	3
	599	AAHIC1 127	GOVINDA	2	7
	600	AAHIC1 130	SULENDER		4
	601	AAHIC1 134	BHAGWATI	2	12
	604	AAHIC1 137	SANJAY		4
	608	AAHIC1 143	RINKU	1	3
	609	AAHIC1 144	RADHEY		4
	610	AAHIC1 146	RAJKUMAR	1	6

	613	AAHIC1 149	SUNIL		2
	614	AAHIC1 150	AJAY	1	12
	617	AAHIC4 005	UMEEDI LAL		2
	618	AAHIC4008	DINESH		8
	621	AAHIC4019	PHULANDEVI		10
	624	AAHIC4024	BADAL MANDAL		5
	627	AAHIC4028	SURESH KUMAR		5
	628	AAHIC4029	BHAGTI		5
	630	AAHIC4033	RAMPARMESH		5
	632	AAHIC4035	JHULAN MANDAL		5
	635	AAHIC4040	RAJKUMAR MANDAL	1	4
	639	AAHIC4047	DURYACHAN HANDAL	1	7
	640	AAHIC4049	BHARAT LAL		6
	641	AAHIC4050	VIKRAM		4
	642	AAHIC4051	KISHAN		2
	646	AAHIC4057	SAPAN MANDAL		6
	647	AAHIC4059	SUNITA		7
Team 5	648	AAHIC4 063	TINKU MANDAL	2	6
	650	AAHIC4 071	KALIYA MANDAL		2
	651	AAHIC4 073	MALTI DEVI		2
	652	AAHIC4074	NEERAJ DEVI		2
	656	AAHIC4 080	GEETA		4
	658	AAHIC4085			2

659	AAHIC4086	DASHRATH	1	7
661	AAHIC4095	SUKHDEV MANDAL		2
662	AAHIC4096	HIRA LAL		2
663	AAHIC4097	DILIP		2
665	AAHIC4 100			1
667	AAHIC4103	PRATAP		4
668	AAHIC4105			3
672	AAHIC4115	NIRBAL	1	6
673	AAHIC4116	NITULA MANDAL		3
676	AAHIC4123	PRAMOD	1	4
677	AAHIC4131	KHELU MANDAL		3
678	AAHIC4132	NIRMAL MANDAL		1
680	AAHIC4 135	AMAR GOSWAMI	1	3
682	AAHIC4 140	BHUDEV MANDAL		9
683	AAHIC4143	AUSAF	1	3
685	AAHIC4149	CHANDAN MANDAL	1	3
687	AAHIC4152	AJAY MANDAL	1	4
689	AAHIC4154			3
690	AAHIC4 156	KISHAN MANDAL	1	6
693	AAHIC4163	ACHAL MANDAL	1	4
694	AAHIC4164	SAMARJEET		7
696	AAHIC4 167	SANAJY		2
697	AAHIC4 168	MANTU		1

698	AAHIC4 169			1
699	AAHIC4 175	NIKHIL MANDAL	1	5
702	AAHIC4 182	DIVESH MANDAL		6
703	AAHIC4 184	BABLU		5
704	AAHIC4 188	NIMAY MANDAL	1	6
705	AAHIC4 191			1
706	AAHIC4 196	SANJAY		7
707	AAHIC4 199	RAJU		5
708	AAHIC4 200	RATAN		3
709	AAHIC4 202	NIMAY MANDAL		9
711	AAHIC4 207	GOPAL		7
713	AAHIC4214	ANEK MANDAL		5
715	AAHIC4217	KALU MANDAL		6
717	AAHIC4221	JHALLU		4
719	AAHIC4223	DULAL GHOSH		4
720	AAHIC4224	GOKTAK MANDAL		20
721	AAHIC4229	ZAREENA KHATUN	2	8
722	AAHIC4233			1
725	AAHKT1007	PHOOL KUMAR	0	7
726	AAHKT1008	KRIPA NAND ROY	0	4
728	AAHKT1013	ARUL KAMAT	0	6
729	AAHKT1015	SANJAY	0	5
730	AAHKT1020	DILCHAND KAMAT	0	5

	734	AAHKT1026	SHANKAR KAMAT	0	3
	737	AAHKT1033+A	BUDHESHWAR KAMAT	0	7
	738	AAHKT1037	SUNIL KAMAT	2	5
	741	AAHKT1044	IBRAR	0	4
	742	AAHKT1048	DEV NARAYAN	0	8
	743	AAHKT1049	DILIP	0	4
	744	AAHKT1050	MAUNSI DEVI	0	2
	745	AAHKT1053	RAVI LAL	0	6
	746	AAHKT1055	AMOD KUMAR	1	5
	747	AAHKT1056	JEEVACH KAMAT	0	1
	748	AAHKT1058+A	RAM GOPAL	0	6
	749	AAHKT1060	HEERA LAL KAMAT	2	7
	750	AAHKT1061	DURGA NAND KAMAT	0	4
	752	AAHKT1064	SINTU	0	2
	753	AAHKT1066	MANTU	0	1
	754	AAHKT1070	RAJ KUMAR	2	5
	755	AAHKT1073	JAGDISH DAS	0	1
	756	AAHKT1075+B+C	DHARAM DAS	1	5
	758	AAHKT1077	BABUR	0	4
	759	AAHKT1079	LAL DEV KAMAT	0	4
	761	AAHKT1082+A+B	MANIKLAL KAMAT	0	6
	762	AAHKT1084	KANGORE	0	1

	763	AAHKT1085	SANJAY SINGH	0	5
	764	AAHKT1086	SARVESH	0	4
	767	AAHKT1090	RAM PRASAD	0	2
	769	AAHKT1096	SHIV SHANKAR	0	5
	771	AAHKT1100	GOVIND	0	5
	772	AAHKT1101	SATYALAL KAMAT	0	3
	773	AAHKT1102	KAMESHWAR KAMAT	0	4
	774	AAHKT1103	KAPIL KAMAT	0	1
	775	AAHKT1104	SUBHAKLAL KAMAT	0	2
	776	AAHKT1107	DHAINIKLAL KAMAT	0	7
Team 2	777	AAHKT1108	SURATLAL KAMAT	2	6
	779	AAHKT1116	RAVINDER CHAUDHARY	0	2
	780	AAHKT1119	RAMANADAN	0	2
	783	AAHKT1125	SANJEEV KAMAT	3	5
	787	AAHKT1132	kishore kumar	0	3
	788	AAHKT1133	shri ram vilas kamat	0	11
	789	AAHKT1134	bajrani kamat	1	3
	790	AAHKT1135	hare ram kamat	0	6
	792	AAHKT1140	mohan kamat	1	3
	793	AAHKT1143	arun rai	1	3
	796	AAHKT1156	RAM BABU KAMAT	1	5
	797	AAHKT1161	KULDEEP YADAV	0	6
	798	AAHKT1163	JAI NARAYAN KAMAT	0	4

799	AAHKT1172	LAXMAN KAMAT	0	2
801	AAHKT1182	HARI	0	4
804	AAHKT1187	RAMUDGAR KAMAT	1	5
806	AAHKT1193	SHYAM KAMAT	0	5
807	AAHKT1194	ASHOK	0	5
808	AAHKT1195	BAM DEV	0	4
809	AAHKT1199	LAL BABU	1	3
810	AAHKT1200	GAURAV	2	9
811	AAHKT1201	SUSHIL KAMAT	2	5
814	AAHKT1206	OM PRAKASH	0	3

Training Agenda

		Agenda Training For Surveyors				
Days	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Dates	27th June' 17	28th June'17	29th June'17	30th June'17	1st July' 2017	2nd July'2017
Timings						
9:00 to 9:30 am	Registration and Introduction	Recap of the previous Day	Recap of the previous Day	Standardization Test Introduction	Recap of the previous Day	Explain field procedures
9:30 to 9:45 am	Buffer for Day 1	Weight	Managing Referrals	Standardization Test Introduction	Arrival at survey area	Field Test
9:45 to 10:45 am	SMART Overview	Weight	Mortality	Standardization Test	ODK	Field Test
10:45 to 11:00 am	Tea Break					
11:00 to 11:45 am	Survey Teams	Height	Mortality	Standardization Test	ODK	Field Test
11:45 to 1:00 pm	Questionnaire Design	Length	Mortality	Standardization Test	ODK	Field Test
1:00 to 1:45 pm	Lunch Break					
1:45 to 2:45 pm	Event Calendar cont...	MUAC	Sampling	Standardization Test	Daily check of data	Field Test
2:45 to 3:30 pm	Event Calendar cont...	Oedema	Special Cases	Standardization Test	Questionnaire - Practice/informed consent	Discussion - Field Test
3:30 to 3:45 pm	Tea Break					
3:45 to 4:45 pm	Malnutrition	Interpretation of Results	Discussion on queries	Discussion of Results	Questionnaire - Practice	Discussion - Field Test
4:45 to 5:00 pm	Discussion and Wrap up	Discussion and Wrap up	Discussion and Wrap up	Discussion and Wrap up	Discussion and Wrap up	Discussion and Wrap up

Evaluation of Enumerators (Standardisation Report)

		Precision			Accuracy			OUTCOME		
Weight		subjects	mean	SD	max	Technical error		TEM/mean		Coef
of reliability		Bias from superv			Bias from median		result			
#		kg	kg	kg	TEM (kg)	TEM (%)		R (%)		Bias
(kg)	Bias (kg)									
Supervisor	10	12.4	2.5	0.1	0.05	0.4	100	-	-0.52	
TEM acceptable		R value good			Bias good					
Enumerator 1	10	12.4	2.5	0.2	0.06	0.5	99.9	0.02	-0.51	
TEM acceptable		R value good			Bias good					
Enumerator 2	10	12.4	2.5	0.6	0.15	1.2	99.7	0	-0.52	
TEM poor		R value good			Bias good					
Enumerator 3	10	12.5	2.6	0.4	0.15	1.2	99.6	0.09	-0.43	
TEM poor		R value good			Bias good					
Enumerator 4	10	12.5	2.6	0.4	0.13	1.1	99.7	0.1	-0.42	
TEM poor		R value good			Bias good					
Enumerator 5	10	12.4	2.6	0.3	0.11	0.9	99.8	-0.02	-0.55	
TEM poor		R value good			Bias good					
Enumerator 6	10	12.4	2.5	0.4	0.11	0.9	99.8	-0.02	-0.54	
TEM poor		R value good			Bias good					
Enumerator 7	10	12.3	2.5	0.2	0.06	0.5	99.9	-0.04	-0.56	
TEM acceptable		R value good			Bias good					
Enumerator 8	10	12.3	2.6	0.4	0.11	0.9	99.8	-0.07	-0.59	
TEM poor		R value good			Bias good					
Enumerator 9	10	12.4	2.5	1.3	0.35	2.8	98.1	0.01	-0.51	
TEM reject		R value acceptable			Bias good					
Enumerator 10	10	12.3	2.6	0.3	0.12	0.9	99.8	-0.03	-0.55	
TEM poor		R value good			Bias good					
Enumerator 11	10	12.4	2.6	0.4	0.13	1	99.7	-0.01	-0.53	
TEM poor		R value good			Bias good					
Enumerator 12	10	12.3	2.6	0.4	0.11	0.9	99.8	-0.05	-0.57	
TEM poor		R value good			Bias good					
Enumerator 13	10	12.4	2.5	0.2	0.05	0.4	100	0.02	-0.5	

TEM acceptable				R value good	Bias good					
Enumerator 14	10	12.4	2.5	0.4	0.13	1	99.7	0.03	-0.49	
TEM poor				R value good	Bias good					
enum inter 1st	14x10	12.4	2.5	-	0.16	1.3	99.6	-	-	
TEM acceptable				R value good						
enum inter 2nd	14x10	12.4	2.5	-	0.15	1.2	99.6	-	-	
TEM acceptable				R value good						
inter enum + sup	15x10	12.4	2.5	-	0.15	1.2	99.6	-	-	
-	TEM acceptable			R value good						
TOTAL intra+inter	14x10	-	-	-	0.21	1.7	99.3	0	-0.52	
TEM poor				R value good	Bias good					
TOTAL+ sup	15x10	-	-	-	0.2	1.6	99.3	-	-	
TEM acceptable				R value good						

Height of reliability	subjects	mean	SD	max	Technical error		TEM/mean	Coef	
	Bias from superv			Bias from median		result			
#	cm	cm	cm	TEM (cm)	TEM (%)	R (%)	Bias		
(cm)	Bias (cm)								
Supervisor	10	91.2	10.7	0.3	0.15	0.2	100	-	-0.32
TEM good				R value good					
Enumerator 1	10	91.5	11	1	0.27	0.3	99.9	0.28	-0.04
TEM good				R value good	Bias good				
Enumerator 2	10	91.9	10.5	22.4	6.81	7.4	58.2	0.77	0.45
TEM reject				R value reject	Bias poor				
Enumerator 3	10	91.6	10.6	1.6	0.51	0.6	99.8	0.43	0.11
TEM acceptable				R value good	Bias acceptable				
Enumerator 4	10	91.8	10.5	2.1	0.6	0.7	99.7	0.64	0.32
TEM poor				R value good	Bias poor				
Enumerator 5	10	91.7	10.6	1.2	0.36	0.4	99.9	0.55	0.23
TEM good				R value good	Bias acceptable				
Enumerator 6	10	91.8	10.6	1	0.45	0.5	99.8	0.65	0.33
TEM acceptable				R value good	Bias poor				
Enumerator 7	10	91.8	10.6	1	0.44	0.5	99.8	0.64	0.32
TEM acceptable				R value good	Bias poor				
Enumerator 8	10	91.7	10.7	1.4	0.45	0.5	99.8	0.57	0.25
TEM acceptable				R value good	Bias acceptable				

Enumerator 9	10	91.5	10.9	0.6	0.27	0.3	99.9	0.32	0
TEM good	R value good		Bias good						
Enumerator 10	10	92	10.5	1.7	0.51	0.6	99.8	0.79	0.47
TEM acceptable	R value good		Bias poor						
Enumerator 11	10	92	10.5	1.6	0.45	0.5	99.8	0.78	0.46
TEM acceptable	R value good		Bias poor						
Enumerator 12	10	91.8	10.7	1.2	0.38	0.4	99.9	0.63	0.31
TEM good	R value good		Bias poor						
Enumerator 13	10	91.5	11	0.3	0.11	0.1	100	0.32	0
TEM good	R value good		Bias good						
Enumerator 14	10	87.9	20.5	80.5	18.01	20.5	23.1	-3.28	-3.6
TEM reject	R value reject		Bias good						
enum inter 1st	14x10	91.2	12.4	-	6.8	7.5	69.8	-	-
TEM reject	R value reject								
enum inter 2nd	14x10	91.8	10.4	-	2.63	2.9	93.7	-	-
TEM reject	R value poor								
inter enum + sup		15x10	91.5	11.4	-	4.56	5	82.9	-
-	TEM reject	R value reject							
TOTAL intra+inter		14x10	-	-	-	7.29	8	59.3	0.29
-0.05	TEM reject	R value reject		Bias good					
TOTAL+ sup		15x10	-	-	-	7.05	7.7	61.6	-
TEM reject	R value reject								

MUAC	subjects	mean	SD	max	Technical error		TEM/mean	Coef	
of reliability	Bias from superv			Bias from median			result		
#	mm	mm	mm	TEM (mm)	TEM (%)		R (%)	Bias	
(mm)	Bias (mm)								
Supervisor	10	146.4	8.6	4.5	1.37	0.9	97.4	-	-0.65
TEM good	R value acceptable			Bias good					
Enumerator 1	10	145.7	7.9	10	2.74	1.9	87.8	-0.65	-1.3
TEM poor	R value reject		Bias good						
Enumerator 2	10	142.9	9.8	9	2.86	2	91.5	-3.45	-4.1
TEM poor	R value poor		Bias good						
Enumerator 3	10	145	9.3	18	5.57	3.8	64.4	-1.35	-2
TEM reject	R value reject		Bias good						
Enumerator 4	10	146.9	8.4	5	1.34	0.9	97.4	0.55	-0.1

TEM good	R value acceptable	Bias good							
Enumerator 5	10	145.8	10.4	11	3.83	2.6	86.3	-0.55	-1.2
TEM reject	R value reject	Bias good							
Enumerator 6	10	146.4	10.1	6	2.52	1.7	93.8	0.1	-0.55
TEM acceptable	R value poor	Bias good							
Enumerator 7	10	146.6	9.9	6	2.52	1.7	93.5	0.2	-0.45
TEM acceptable	R value poor	Bias good							
Enumerator 8	10	146.3	9.1	8	2.57	1.8	92	-0.05	-0.7
TEM acceptable	R value poor	Bias good							
Enumerator 9	10	146.7	9.4	13	5.39	3.7	67.4	0.35	-0.3
TEM reject	R value reject	Bias good							
Enumerator 10	10	148.9	8.8	13	3.29	2.2	86	2.55	1.9
TEM poor	R value reject	Bias acceptable							
Enumerator 11	10	148.4	8.8	5	1.9	1.3	95.3	2.05	1.4
TEM good	R value acceptable	Bias acceptable							
Enumerator 12	10	147.5	9.1	6	2.43	1.6	92.9	1.15	0.5
TEM acceptable	R value poor	Bias good							
Enumerator 13	10	148.4	11.3	30	7.32	4.9	58.4	2	1.35
TEM reject	R value reject	Bias acceptable							
Enumerator 14	10	143.4	10.1	8	2.94	2.1	91.6	-2.9	-3.55
TEM poor	R value poor	Bias good							
enum inter 1st	14x10	146.3	9.2	-	4.29	2.9	78.5	-	-
TEM reject	R value reject								
enum inter 2nd	14x10	146.4	9.6	-	4.68	3.2	76.4	-	-
TEM reject	R value reject								
inter enum + sup	15x10	146.4	9.4	-	4.32	3	79.1	-	-
- TEM reject	R value reject								
TOTAL intra+inter	14x10	-	-	-	5.83	4	61.7	0	-0.65
-0.65 TEM reject	R value reject	Bias good							
TOTAL+ sup	15x10	-	-	-	5.64	3.9	63.7	-	-
TEM reject	R value reject								

Suggested cut-off points for acceptability of measurements

Parameter	MUAC mm	Weight Kg	Height cm
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individual good <2.0 <0.04 <0.4

TEM acceptable <2.7 <0.10 <0.6

(intra) poor <3.3 <0.21 <1.0

reject >3.3 >0.21 >1.0

Team TEM good <2.0 <0.10 <0.5

(intra+inter) acceptable <2.7 <0.21 <1.0

and Totalpoor <3.3 <0.24 <1.5

reject >3.3 >0.24 >1.5

R value good >99 >99 >99

acceptable >95 >95 >95

poor >90 >90 >90

reject <90 <90 <90

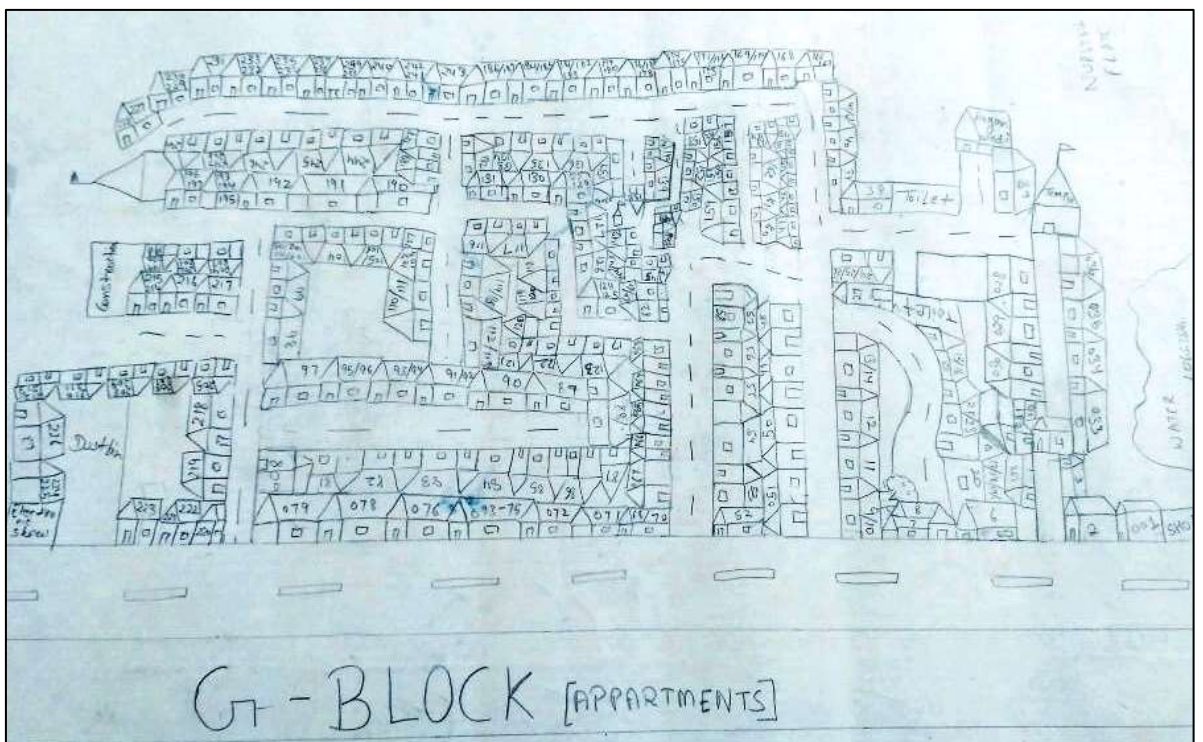
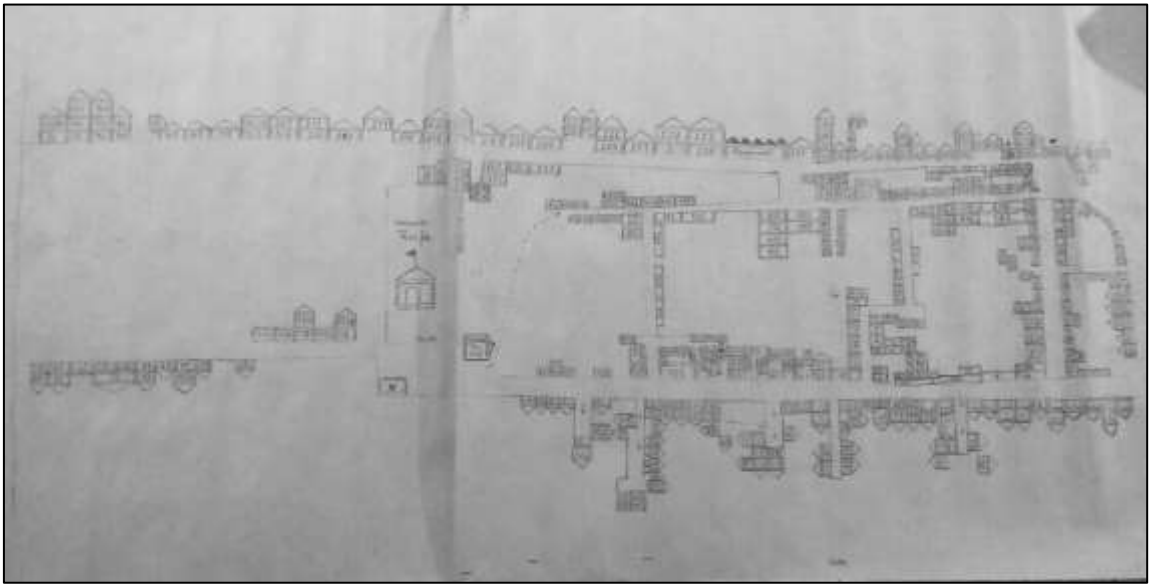
Bias good <1 <0.04 <0.4

From sup if good acceptable <2 <0.10 <0.6

"outcome, otherwise" poor <3 <0.21 <1.4

from median reject >3 >0.21 >1.4

Maps of the area



Questionnaire: Anthropometry

Date of Survey (dd/mm/yyyy)				Slum Number			HH Number			Team Number		
//_												

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Child ID	Name of the child	Sex (Female/ male)	Birthday* (DD/MM/YYYY)	Age** (months)	Weight (kg) (00.0)	Height if >2 years Length if < 2 years (cm) (000.0)	MEASURE L= if child measured lying down instead of height H =vice versa.	Bilateral Oedema (yes/ no)	MUAC (mm) (000) Left arm	Measles vaccination (9-59 months) [Must see card if available]	Does your child suffered from diarrhoea in last 15 days	Does your child suffered from ARI in the past 15 days?
		F/M	DD/MM/YYYY Y				L/H	Y/N		1 = Yes, w/ card 2 = Yes, w/o card 0 = No 8 =Don't know	1 = Yes 0= No 8 = Don't know	1 = Yes 0 = No 8 = Don't know
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

Questionnaire: Mortality

Date of Survey (dd/mm/yyyy)			Slum Number		HH Number			Team Number		
//_/_			_/_		_/_/_			—		

01	02	03	04	05	06	07	08	09	10
No	Name	Sex (M/F)	Age (Yrs)	Any one Joined after Holi 2017?	Did any leave after Holi 2017?	After Holi does any child born in this HH	Did anyone die after Holi?	Cause of death (Optional)	Location of death (Optional)
				Start of Recall period Holi 2017					

a). List all the household members that are currently living in this household

1									
2									
3									
4									
5									

b). list all the household members that have left this HH since Holi 2017 ?

1					Y				
2					Y				
3					Y				
4					Y				
4					Y				

C). List all the household members who died since Holi 2017

1									
2									
3									
4									
5									

Questionnaire: IYCF

No	QUESTION	ANSWER CODES	Child 1	Child 2	Child 3
SECTION IF1					
IF0	Child ID	Take from the previous questionnaire or create new one based on existing ID no.			
IF1	Sex	Male 1 Female 2	__ 	__ 	__
IF2	Birthdate TAKE FROM THE PREVIOUS QUESTIONNAIRE- DO NOT ASK MOTHER AGAIN	Day/Month/Year			
IF3	Child's age in months TAKE FROM THE PREVIOUS QUESTIONNAIRE- DO NOT ASK MOTHER AGAIN				
IF4	What did you give your child first after Birth?	Breast milk.....01 Plain water.....02 Water and sugar or honey.....03 Milk such as powder or animal milk.....04 Fruit juice.....05 Janamghutti.....06 Oil/ Ghee.....07 Turmeric with oil.....08 Any other liquid.....09	__ 	__ 	__
IF5	When did you start breastfeeding (Name of child)?	Less than 1 hour.....01 Between 1 and 5 hours.....02 Between 5 hours to 1 day.....03 More than one day.....04 Don't know.....05	__ 	__ 	__
IF6	Was (Name) breastfed yesterday during day and the night?	Yes.....01 No.....0	__ 	__ 	__
IF7	Did (Name) eat any solid, semi-solid or soft foods yesterday during day and the night?	Yes.....01 No.....0	__ 	__ 	__
IF8	At what age was other (semi-solid/solid) food was introduced?	Months (Age)			
IF9	When did you stop breastfeeding?	Still breastfeeding.....01 Before 6 months.....02 Between age of 6 – 12 months.....03 Between 1 to 2 years.....04	__ 	__ 	__

Questionnaire WASH

No	QUESTION	ANSWER CODES
SECTION WH		
WH1	What is the <i>main</i> source of drinking water utilized by the members of this House Hold? IF OTHER PLEASE MENTION SOURCE	Piped water.....01 Public tap/standpipe.....02 Tube well/borehole (& pump).....03 Protected dug well.....04 Protected spring.....05 Unprotected spring.....06 Unprotected dug well.....07 Small water vendor.....08 Tanker truck.....09 Bottled water.....10 Surface water (e.g. river, pond)11 Other.....96 If other _____
WH2	Do you cover containers when transporting?	Yes, all of them are covered every time....01 Some are covered some are not.....02 No, do not cover03
WH3	How is drinking water stored within the HH?	Same container used for collection/transport.....01 Bucket/ pitcher/ container uncovered.....02 Bucket/ pitcher /container covered.....03 Bucket/pitcher/container with cover and tap.....04
WH4	How often do you wash the container for storing water?	Every day.....01 Twice per week.....02 Once per week03 less than once per week others.....04
WH5	What kind of toilet facility being used in this HH? TOILET	Flush to piped sewer system.....01 Flush to septic system.....02 Open Defecation (Railway tracks/ Dumping area).....03 Community Toilets.....04 Composting/dry latrine.....05 Flush or pour-flush elsewhere.....06 Pit latrine without floor/slab.....07 Service or bucket latrine.....08 Hanging toilet/latrine.....09 No facility, field, bush, plastic bag.....10

WH6	Ownership of the toilets OBSERVE THE MOST COMMON METHOD OF OWNING THE TOILETS	Team Leader SELECT ONE ONLY Not shared (1 HH).....01 Shared family (2 HH).....02 Communal toilet (3 HH or more).....03 Public toilet (in market or clinic etc.).....04 Don't know.....08	__
WH7	On a normal day, do you wash your hands? If yes then ask the following questions	No, I don't specifically wash my hand.....01 Yes, I do wash my hands.....02	__
WH8	If yes, what times do you wash your hands? (Multiple answers possible /DO NOT PROMPT)	Yes, before cooking food01 Yes, after defecation.....02 Yes, before praying03 Yes, after eating food04 Yes, before eating food.....05 Yes, whenever they look/feel dirty.....06 Yes, after disposing of child's feces/cleaning child.....07 Yes, after working with animals, crops, etc08 Yes, before feeding a child/breastfeeding09	__
WH9	MOST OFTEN, what do you use to wash your hands? / Ask open ended. Only one answer representing most frequent behaviour	Water only.....01 Water and ash.....02 Water and sand/mud.....03 Water and soap.....04 Other: (specify) _____	__

Event Calendar

2017	2016	2015	2014	2013	2012
January (6)	January (18)	January (30)	January (42)	January (54)	
Republic Day / happy new year / lohri / makar sankranti	New year/ Guru gobind singh jayanti /makar sankranti/ republic day/ lohri	Republic Day/Id-E-Milad / happy new year/lohri / makar sakarant/ basant panchmi	happy new year, guru govind singh jayanti, republic day, lohri, makarsakrant	Republic Day / Happy New Year/Eid/Lohri/ Makarsakranti	
February (5)	February (17)	February (29)	February (41)	February (53)	
Maha Shivratri/Chatrapati Shivaji Maharaj Jyanti, winters end	basant panchmi / winter ends	aap election/winters end/Mahashivratri	basant panchmi, maha shivratri	Basanta Panchami/Saraswati Puja/ Winters End	
March (4)	March (16)	March (28)	March (40)	March (52)	
Holi/Gudi padwa/Ram Navami/summers starts	maha shivratri / good Friday/ holi	Holi/navratri/summers starts	Holi/summers starts	Maha Shivratri/Holi, Summers starts	
April (3)	April (15)	April (27)	April (39)	April (51)	
Mahavir Jayanti Good Friday Dr. Baba Saheb Ambedkar's Birthday/Tamil New Year's Day/Baisakhi/Biju Festival/Bohag Bihu	Ram Navami • Dr. B R Ambedkar Jayanti/Maha Veer jayanti General Parliamentary Election 2014	ambedkar jayanti/ baisakhi	Mahavir Jayanti/good Friday/Dr Ambedka jayanti /Mahavir jyanti/ ram navmi	Ram Navmi/Ambedkar Jayanti/ Mahavir Jayanti	
May (2)	May (14)	May (26)	May (38)	May (50)	
Buddha Purnima/Maharashtra Day, summers ends	Buddha Purnima/Maharashtra Day, summers end	Buddha purnima /dussehra ganga	Buddha Purnima/Maharashtra Day, summers end	Buddha Pournima, Summers end	
June (1)	June (13)	June (25)	June (37)	June (49)	
	rainy season starts	rainy season starts	rainy season starts	rainy season starts	
	July (12)/1yr	July (24)/2yr	July (36)/ 3yr	July (48)/ 4rs	August (60)/ 5yrs
	Ramzan-Id	monsoon /eid	eid		Raksha bandhan, janamashtmi.
	August (11)	August (23)	August (35)	August (47)	september
	Independence day/janmasthami/ Raksha Bandhan	Independence day /onam/rakshabandhan	Independence Day/Rakshabandhan/Janmasthami/ ganesh chaturthi	Independence Day/ Janmasthami/Id ul Fitur/Ramzan/Raksha bandhan	
	September (10)	September (22)	September (34)	September (46)	October (58)
	ganesh chaturthii / bakrid	janamashtmi / ganesh chaturthi/vishwakarma puja/bakrid		Ganesh Puja/ rainy seasons end/Ganesh Cathurthi	gandhi jayanti, dussheera, eid, valmiki jayanti
	October (9)	October (21)	October (33)	October (45)	November (57)
	Mahatma Gandhi Jayanti/Mahanavami/Durga Asthami/Vijaya Dashmi/Durga Puja)General Assembly Election • Diwali, winters starts / govardhan puja	Mahatma Gandhi Jayanti • navratri / dussehra /karva chauth/ muharram /winter starts	Dussehra/Bakar-Id/Mahatma gandhi jayanti, winetrs starts/ chhatt puja/ muharram/ diwali	Gandhi Jayanti/Bakar Id /Dushheera/Kali Puja/Durga Puja	diwali, govardhan pooja, bhai dhoj, chatt puja
	November (8)	November (20)	November (32)	November (44)	December (56)
	Bhai dooj / chhath puja / guru nanak jayanti/Demonitization	Dhanteras/ DIWALI/ govardhan puja/ bhayiya dooj / chhath puja/ guru	Guru Nanak Jayanti	Diwali/Bhai Duj/Govar Dhan/Winter Season Starts	muharram, christmas day
	December (7)	December (19)	December (31)	December (43)	
	X Mas/Christmas Day / id	X Mas/Christmas Day/ eid	X Mas Day/christmas	X Mas/Christmas Day	

Pictures



Picture 1: Enumerators doing exhausting enumeration of households in the slum pockets



Picture 2: Surveyors while taking length of the child



Picture 3 Surveyors during standardisation test



Picture 4 Team of Volunteers supported entire Survey