Anthropometric and Mortality SMART Survey
Laghman Province - Afghanistan
1st - 24th December 2015

Preliminary Report

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and
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Action Contre la Faim
ACF is a non-governmental, non-political and non-religious organization

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ABBREVIATIONS

ACF	Action Contre la Faim
BHC	Basic Health Center
BPHS	Basic Package of Health Services
CDR	Crude Death Rate
CHC	Comprehensive Health Center
CHF	Common Humanitarian Fund
CSO	Central Statistics Organization
ENA	Emergency Nutrition Assessment
EPI	Expanded Program for Immunization
EPHS	Essential Package Health Services
GAM	Global Acute Malnutrition
HAZ	Height-for-Age
HH	Household
MOPH	Ministry of Public Health
MUAC	Mid-Upper Arm Circumference
SD	Standard Deviation
RC	Reserve Cluster
SAM	Severe Acute Malnutrition
SCA	Swedish Committee for Afghanistan
SMART	Standardized Monitoring and Assessment of Relief Transition
U5DR	Under-five Death Rate
WASH	Water Sanitation and Hygiene
WFP	World Food Programme
WHZ	Weight-for-Height
WHO	World Health Organization

TABLE OF CONTENTS

Acknowledgement 2
Abbreviations 3
Table of contents 4
Executive Summary 5
Introduction 5
Survey objective 6
METHODOLOGY 6
Sample size calculation 6
Final sampling strategy 7
Survey team composition and supervision 8
Data entry and analysis 8
Results 9
Anthropometric results 9
Undernutrition rates 9
Quality of the anthropometric data 11
Crude and Under-5 Mortality Rates 11
Health and immunization 11
CONCLUSION 13
Recommendations 13
annexes 14
ANNEX1: Plausibility check 14

EXECUTIVE SUMMARY

The nutrition SMART[1] survey was conducted on 1st December to 24th December, 2015 in five districts of Laghman Province. A total of 561 households were assessed using a two-stage cluster sampling methodology. The survey preliminary report provides a summary on the methodology used, analysis and interpretation of survey findings and recommendations proposed. The final report will contain full analysis and some additional recommendations.

Summary of the main findings:

- 1023 children from 0-59 were sampled; out of them 925 were children 6-59.
- Global Acute Malnutrition (GAM) and Severe Acute Malnutrition (SAM) prevalence based on Weight-for-Height (WHZ) was of 9.8 % (95%CI 7.6-12.5) and 2.3% (95%CI 1.5-3.6) respectively.
- GAM and SAM prevalence based on Mid Upper Arm Circumference (MUAC) was 10.1% (95% CI 7.7-13.1) and 2.2% (95% 1.2-3.9) respectively.
- Combined GAM prevalence(by WHZ <-2 z-scores and/or MUAC<125 mm and/or the presence of bilateral oedema) is 16.8% (14.3-19.2 95% C.I.) and SAM of 5.7% (95%CI 4.2-7.2) respectively
- Crude Death Rate (CDR) and Under-five Death Rate (U5DR) was 0.22 (95% CI 0.12-0.41) and 0.98 (95% CI: 0.48-1.99) deaths/10,000/day respectively.
- Prevalence of stunting was of 47.8 % (95 %CI: 43.3-52.3) and severe stunting was of20.8 % (17.1-25.1 95% CI) respectively.
- Prevalence of underweight was 30.2% (25.5-35.4 95% CI) and severe underweight was 9.8% (7.4-12.9 95% CI) respectively
- Major illnesses or symptoms among children from 0-59 months 2 weeks prior the survey were Acute Respiratory Infections (56,2%) Fever (47,2%) and diarrhea (14,1%).
- Deworming was low (51,7%) while vitamin A supplementation (80,5%), measles (93,5%), BCG (97,4%) and Polio (97,2%) vaccination coverage was found good.

INTRODUCTION

Laghman is one of the 34 provinces of Afghanistan, located in the eastern part of the country. Mehterlam district hosts the capital of the province and the others districts are Alingar, Alishing, Dawlat shah, Qarghayi and Baad Pukh. The total area of the province is estimated to be 3,842km^2 with an estimated total population number at 445,600[2]. The survey was conducted over 5 districts. Baad Pukh district was excluded from the survey, due to insecurity reported at the time of the survey planning. Secondary security assessments done over the remaining 5 districts indicated the final list of villages accessible for the assessment. The insecure areas of the districts were not included into the sampling frame of the survey. This assessment covered 241,734 out of 445,600 inhabitants of the province, representing 54% of coverage.

The survey was conducted from 1st to 24th December, 2015 during the winter season. It is important to note that the survey findings cannot be extrapolated to represent the entire province but only representative of surveyed areas.

[1] Standardized Monitoring of Assessment for Relief and Transition

[2] Settled population of Laghman province by Civil Division, Urban, Rural and Sex 2012-2013 CSO

SURVEY OBJECTIVE

The overall survey objective was to evaluate the nutritional status of vulnerable groups mainly children less than five years of age in the five districts of Laghman province and study factors contributing to it.

METHODOLOGY

Sample size calculation

The hypothesis used to estimate the minimum anthropometric sample size depends on the set of parameters and assumptions highlighted in table 1.

Table 1: Sample size calculation for anthropometry, SMART Laghman, December 2015

Parameters for Anthropometry	Value	Assumptions based on context
Estimated Prevalence of GAM (%)	11.8%	The GAM rate of the neighbouring province of Kunar from August 2015 was used to set expected GAM value for Laghman.
± Desired precision	3%	Based on the estimated prevalence, as recommended from SMART guideline[3], a desired precision of ± 3 was selected.
Design Effect	1.5	The population living in the 5 targeted districts is considered as having similar living conditions and the same access to food and social conditions. Hence the design effect was estimated at 1.5.
Children to be included	**725**	Minimum Children 6-59 months old. However, all children from 0 to 59 months old found in the selected households were surveyed in order to gather data on infants.
Average HH Size	7.7	According to the National Nutrition Survey 2013, the average household size is **7.7** – most recent result.
% Children under-5	19.8%	Most recent SMART survey conducted in Kunar province indicated 19.8% of children are less than 5 years.
% Non-response Households	6%	The percentage of non-respondent households was estimated at 6%, as the risk of households refusing to participate might be great.
Households to be included	**562**	Minimum number of Households to get the minimum number of children for the sample.

[3] SMART Guidelines, 2006 (http://smartmethodology.org/)

Table 2 reflects the hypothesis parameters for the mortality sample. ENA for SMART software 2011 (9th July 2015 update) was used in actual calculation of sample size.

Table 2: Sample size calculation for mortality, SMART Laghman, December 2015

Parameters for Mortality	Value	Assumptions based on context
Estimated Death Rate /10,000/day	0.5/10000/day	No updated death rate at population level; Recommended in cases where there is no specific mortality data for the area to be surveyed
± Desired precision /10,000/day	0.3	In order to meet set mortality objectives and in line to estimated death rate
Design Effect *(if applicable)*	1.5	Cater for heterogeneity in the County population being sampled is homogeneous
Recall Period in days	120	No event attached to the start of the recall period. It was proposed to have a recall period of 4 calendar months.
Population to be included	**2904**	Minimum number of individuals required for mortality
Average HH Size	7.7	According to the National Nutrition Survey 2013, the average household size is 7.7 – most recent result.
% Non-response Households	6%	The percentage of non-respondent households was estimated at 6%, as the risk of households refusing to participate might be great.
Households to be included	**401**	Minimum number if households to get minimum individuals

The final number of households for this survey was the higher indicated number from both hypotheses, 562 in this case.

Final sampling strategy

A two-stage cluster sampling methodology was applied. In the first stage clusters/villages were randomly selected from total list of villages (375) in the five districts (with exception of insecure villages) using Probability Proportionate to Size (PPS) design. ENA for SMART software was applied and automatically selected the list of villages representing the clusters and Reserve Clusters (RC) to be used in case more than 10% of total villages would not be accessible. **A total of 47 clusters were proposed and successfully covered.** It's important to note based on previous experiences in implementation of integrated nutrition surveys that a single team can cover a maximum of 12 households in a day. The extrapolation of required number of villages was derived from dividing the minimum sample size of 562 households by 12 to get an approximate 47 clusters (562HHs/12HHs). During survey data collection in villages with large population, the village was divided into smaller segments and a segment was selected randomly to represent the cluster. This division was done based on existing administrative units to include neighborhoods, roads, streets and mosque.

The second stage involved random selection of households from a total list of households for each of sampled villages. All households in each of sampled villages were enumerated and given numbers by the survey team. A total of 12 households were chosen randomly by survey team drawing folded papers with numbers of households from a hat.

A total of 561 households achieved with 1,023 children aged 0-59 months were assessed from respective randomly sampled households. Table 3 summarizes the sample size proposed and the actual achieved. During data collection, survey team had to revisit households at the end of the day to ensure children missing or households not present at the initial visit were covered. A cluster control form was used to record all the missed and absent households.

Table 3: Details of proposed and actual sample size achieved

Number of HH planned	Number of HH surveyed	% surveyed /planned	Number of children 6-59 months planned	Number of children 6-59 months surveyed	Number of children 0-59 months surveyed	% surveyed /planned
562	561	99.8%	725	925	1023	127.6%

The household was the basic sampling unit. Here, a household was defined as all people eating from the same pot and living together (WFP definition). In Afghanistan, the term household is often defined and/or used synonymous with a compound – which potentially represents more than one household as defined here. In this case, a two-step process was ensured with the village leaders/community elders and then identifying compound together with the use of the list of households within the community, asking if there are multiple cooking areas to determine what members of the household/compound should be included in the study.

Survey team composition and supervision

The survey data collection team comprised of five teams with each team having four members. The survey data collection team composition includes one supervisor, one team leader and two data collectors. It was important to note that in each of the team at least one female data collector was required. During data collection every female member of the survey team was accompanied with a mahram[4] to facilitate the work of the female data collectors. The teams were supervised by ACF Program manager, Laghman Provincial Nutrition officer and SCA nutrition program supervisor. It is important to note the survey teams were trained on SMART methodology; they undertook standardization tests and participated in pilot test exercise. The standardization test was also used to group various teams especially the data collectors.

Data entry and analysis

ENA for SMART software was also used to generate anthropometric and mortality results automatically. For the rest of the indicators, they were entered and analysed in Excel.

The anthropometric results are presented as percentage z-scores from WHO 2006 Growth references for the weight-for-height (wasting), height-for-age (stunting) and weight-for-age (underweight) indexes. Separate analysis of wasting based on MUAC cut-offs is automatically done by ENA for SMART too.

Plausibility check automatically generated is used to evaluate quality and representativeness of the data, and therefore – the reliability of the results.

[4] Women are not allowed to go outside without being accompanied by one male relative called locally a 'mahram'.

RESULTS

Anthropometric results

Undernutrition rates

The results are presented with exclusion of SMART flags: Z score values ranging outside -3 to + 3 for all three indexes, WHZ, HAZ and WAZ. The survey findings revealed that the distribution of boys and girls in the sample were equally represented, sex ratio of 1. Age ratio was of 1.11 while the value should be around 0.85. This indicates significant excess of younger children (6-29 months) in the sample (p-value=0.00). See details in Plausibility report (Annex 1).

Table 4: Distribution of age and sex of sample, Laghman SMART, December 2015

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy : girl**
6-17	118	50.6	115	49.4	233	25.2	1.0
18-29	128	50.4	126	49.6	254	27.5	1.0
30-41	110	48.7	116	51.3	226	24.4	0.9
42-53	63	51.6	59	48.4	122	13.2	1.1
54-59	50	55.6	40	44.4	90	9.7	1.3
Total	**469**	**50.7**	**456**	**49.3**	**925**	**100.0**	**1.0**

The anthropometric results in the following tables give overall and sex disaggregated rates with 95% of Confidence Intervals (CI) as follows:

- Acute malnutrition rates based on weight-for-height z-scores and oedema (WHO 2006) in Table 5
- Oedema distribution in Table 6
- Acute malnutrition rates based on MUAC cut offs in Table 7
- Prevalence of underweight based on weight-for-age z-scores(WHO 2006) in Table 8
- Prevalence of stunting based on height-for-age z-scores(WHO 2006) in Table 9

Table 5: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) by sex, Laghman SMART, December 2015

	All n = 902	Boys n = 454	Girls n = 448
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(88) 9.8 % (7.6 - 12.5 95% C.I.)	(51) 11.2 % (8.3 - 15.0 95% C.I.)	(37) 8.3 % (5.7 - 11.8 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(67) 7.4 % (5.5 - 10.0 95% C.I.)	(39) 8.6 % (6.0 - 12.1 95% C.I.)	(28) 6.3 % (4.0 - 9.7 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(21) 2.3 % (1.5 - 3.6 95% C.I.)	(12) 2.6 % (1.5 - 4.7 95% C.I.)	(9) 2.0 % (1.1 - 3.7 95% C.I.)

The prevalence of oedema is 0.0 %

Table 6: Distribution of acute malnutrition and oedema based weight-for-height z-scores, Laghman SMART, December 2015.

	<-3 z-score	>=-3 z-score
Oedema present	Marasmus kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 41 (4.4 %)	Not severely malnourished No. 884 (95.6 %)

The estimated prevalence of acute malnutrition based on MUAC cut offs was different from the WHZ-based estimates. Both indexes/criteria do not cover the same children. Girls were more affected, although this was not a significant trend.

Table 7: Prevalence of acute malnutrition based on MUAC cut offs (and/or oedema) and by sex, Laghman SMART, December 2015

	All n = 921	Boys n = 467	Girls n = 454
Prevalence of global malnutrition (< 125 mm and/or oedema)	(93) 10.1 % (7.7 - 13.1 95% C.I.)	(36) 7.7 % (5.4 - 10.9 95% C.I.)	(57) 12.6 % (9.7 - 16.1 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(73) 7.9 % (6.1 - 10.2 95% C.I.)	(28) 6.0 % (4.2 - 8.5 95% C.I.)	(45) 9.9 % (7.5 - 13.0 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(20) 2.2 % (1.2 - 3.9 95% C.I.)	(8) 1.7 % (0.8 - 3.7 95% C.I.)	(12) 2.6 % (1.5 - 4.6 95% C.I.)

The underweight and the stunting were affecting equally both genders.

Table 8: Prevalence of underweight based on weight-for-age z-scores and by sex, Laghman SMART, December 2015

	All n = 904	Boys n = 456	Girls n = 448
Prevalence of underweight (<-2 z-score)	(273) 30.2 % (25.5 - 35.4 95% C.I.)	(143) 31.4 % (25.6 - 37.8 95% C.I.)	(130) 29.0 % (23.7 - 35.0 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(184) 20.4 % (16.8 - 24.4 95% C.I.)	(99) 21.7 % (17.6 - 26.4 95% C.I.)	(85) 19.0 % (14.6 - 24.2 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(89) 9.8 % (7.4 - 12.9 95% C.I.)	(44) 9.6 % (6.7 - 13.7 95% C.I.)	(45) 10.0 % (7.5 - 13.4 95% C.I.)

Table 9: prevalence of stunting based on height-for-age z-scores and by sex, Laghman SMART, December 2015

	All n = 879	Boys n = 445	Girls n = 434
Prevalence of stunting (<-2 z-score)	(420) 47.8 % (43.3 - 52.3 95% C.I.)	(207) 46.5 % (40.9 - 52.2 95% C.I.)	(213) 49.1 % (43.4 - 54.8 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(237) 27.0 % (24.5 - 29.6 95% C.I.)	(109) 24.5 % (21.4 - 27.9 95% C.I.)	(128) 29.5 % (25.3 - 34.1 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(183) 20.8 % (17.1 - 25.1 95% C.I.)	(98) 22.0 % (17.1 - 27.9 95% C.I.)	(85) 19.6 % (15.6 - 24.3 95% C.I.)

Quality of the anthropometric data

The digit preference score of the survey teams was classified as "excellent" for all. The sex ratio was within accepted limits, while the age ration vas above the limit of 0.85. This suggest eventual biased sample, including more children from the younger age groups.

The table 10 below make a sum up of rest of quality parameters by index. Standards Deviations[5] are within accepted limits as well as the number of WHZ flags is below the limit of 3.13%.

Table 10: Mean z-scores, design effect and excluded subjects, Laghman SMART, December 2015

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	902	-0.50±1.09	1.49	0	23
Weight-for-Age	904	-1.44±1.14	2.63	0	21
Height-for-Age	879	-1.93±1.30	1.80	0	46

Crude and Under-5 Mortality Rates

The crude and under five mortality rates were below the emergency threshold for the region[6].

Table 11: Mortality rates, Laghman SMART, December 2015

Definition	Results (95 % CI)
CMR (total deaths/10,000 people / day)	0.22 (0.12-0.41)
U5MR (deaths in children under five/10,000 children under five / day)	0.98 (0.48-1.99)

Health and immunization

Retrospective morbidity data was collected among children 0 -59 months (two weeks recalls) to assess the occurrence of main diseases. The survey findings revealed that 59.3% of the children had episode of illness in the past 2 weeks prior to the survey. The major illnesses reported include fever, diarrhea and ARI as highlighted in table 12.

[5] http://www.who.int/nutgrowthdb/about/introduction/en/index5.html

[6] WHO's emergency thresholds of CMR 2/10,000/day and U5MR 4/10,000/day respectively.

Table 12: Morbidity status among under-fives, Laghman SMART, December 2015

Parameter	Frequency	Percentage (%)
Acute respiratory Infection (ARI) (n=1023)	575	56.2
Fever (n=1023)	483	47.2
Diarrhoea (n=1022)	144	14.1
Others (n=1023)	14	1.3

Vaccination coverage for the 3 key vaccines (BCG, polio and measles) was high. Availability and quality of record in vaccination card remains a major hindrance to confirm the estimate of immunization and supplementation coverage (summarized in Table 13 below).

Table 13: Immunization, vitamin A and deworming coverage, Laghman SMART, December 2015

Indicators	Frequency	Percentage (%)
Measles by cards (children from 9-59 months) (n=874)	433	49.5
Measles both by recall and cards (children 9-59 months)(n=874)	**817**	**93.5**
BCG scare (children 0-59 months) (n=1023)	**996**	**97.4**
Polio by cards (children 0-59 months)(n=1023)	555	54.3
Polio both by cards and recalls (0-59 months)(n=1023)	**994**	**97.2**

The percentage of the answers on deworming and vitamin A supplementation are in Table 14 below. The result for deworming remains low.

Table 14: Vitamin A supplementation and deworming, Laghman SMART, December 2015

Indicators	Answers	Frequency	Percentage (%)
Vitamin A supplementation (children 6-59 months) (n=926)	**Yes**	**745**	**80,5**
	No	173	18.7
	Don't know	8	0,9
Deworming (children 12-59 months) (n=809)	**Yes**	**418**	**51.7**
	No	366	45.2
	Don't know	25	3.1

CONCLUSION

The survey findings revealed that the prevalence of Global Acute Malnutrition (GAM) based on weight for height z-score was at 9.8% (7.6-12.5 95% CI) at poor level of WHO classification of acute malnutrition[7]. Prevalence of GAM based on MUAC was at 10.1% (7.7-13.1 95% CI). SAM prevalence by both Weight for height z-scores and MUAC was at 2.3% (1.5- 3.6 95% CI) and 2.2% (1.2- 3.9 95% CI) respectively.

Further analysing the data, based on both criteria revealed the combined GAM and SAM rates at **16.8% (14.3-19.2 95% C.I.) and 5.7 % (4.2-7.2 95% C.I.)** respectively. The combined rates can be used for IDP-OPD SAM caseload calculation as well as for targeted supplementary feeding.

The prevalence of stunting was at 47.8% (43.3-52.3 95% CI) considered to be very high based on WHO classification on the gravity of chronic under nutrition (above 40 %).

Crude Death Rate and Under-five Death rate was at 0.22/10,000/day and 0.98/10,000/per day. The rates are both below SPHERE emergency thresholds.

The survey revealed that fever and ARI were the major illnesses reported among under-five, with over 50% of children reported to have been ill two weeks prior to the survey period.

RECOMMENDATIONS

Following recommendation can be drown based on the preliminary findings, per category of action:

High undernutrition rates

- Extension of the Micronutrient Initiative (MI) project, for one more year.
- Expansion of TSFP project to all CHCs and BHCs available in the project.
- Activation of TFUs in Gamba and Qarghayee CHCs

Low preventive nutrition and health care coverage (immunization, deworming and supplementation)

- Strengthening the current EPI (fix, outreach and mobile) systems
- In scope of available SEHAT/WB budget we will expand the EPI services to some of the remaining HSCs.
- For increasing awareness of the community regular broadcasting of EPI related messages through local media.

High morbidity

- To strength the health education program by EPHS/BPHS implementers.
- Distribution and setting of IEC materials at health facility and health post levels to increase health education in community level.
- Promote hygiene and sanitation messages and practices in the health facilities and at community level in order to sensitize the community on the linkages of hygiene and sanitation to child morbidity

More recommendations will be integrated in the final report.

[7] WHO acute malnutrition classification : <5% acceptable, 5-9 % poor, 10-14 % serious, >15 % critical

ANNEXES

ANNEX1: Plausibility check

AFG_122015_ACF_LAGHMAN_SMART.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
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** (2.3 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.669)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**10** (p=0.000)
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	**0** (5)
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** (1.06)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (-0.30)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.04)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.100)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**11** %

The overall score of this survey is 11 %, this is good.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 56 %

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=3/ID=9: HAZ (-5.137), Age may be incorrect
Line=4/ID=12: HAZ (-5.579), WAZ (-4.563), Age may be incorrect
Line=16/ID=43: HAZ (-6.128), Age may be incorrect
Line=40/ID=75: **WHZ (-4.525)**, WAZ (-4.470), Weight may be incorrect
Line=57/ID=52: HAZ (1.713), Age may be incorrect
Line=63/ID=20: HAZ (11.260), WAZ (3.565), Age may be incorrect
Line=68/ID=31: WAZ (1.996), Weight may be incorrect
Line=75/ID=28: HAZ (1.398), Age may be incorrect
Line=78/ID=91: **WHZ (-3.355)**, Weight may be incorrect
Line=94/ID=84: HAZ (1.302), Age may be incorrect
Line=110/ID=136: HAZ (-5.410), Age may be incorrect
Line=111/ID=133: **WHZ (-3.743)**, HAZ (2.547), Height may be incorrect
Line=122/ID=242: **WHZ (-3.539)**, WAZ (-5.163), Weight may be incorrect
Line=125/ID=233: HAZ (-4.909), Age may be incorrect
Line=127/ID=234: **WHZ (-5.565)**, HAZ (-8.187), WAZ (-7.299)
Line=129/ID=235: HAZ (-5.337), WAZ (-4.462), Age may be incorrect
Line=135/ID=349: **WHZ (-4.132)**, Weight may be incorrect
Line=136/ID=346: HAZ (6.016), WAZ (2.484), Age may be incorrect
Line=138/ID=356: **WHZ (-4.717)**, WAZ (-4.801), Weight may be incorrect
Line=145/ID=363: **WHZ (-3.901)**, Weight may be incorrect
Line=148/ID=352: **WHZ (-4.395)**, WAZ (-4.754), Weight may be incorrect

Line=150/ID=354: HAZ (-5.311), Age may be incorrect
Line=153/ID=415: WAZ (-5.208), Age may be incorrect
Line=158/ID=414: WAZ (-5.365), Age may be incorrect
Line=162/ID=424: **WHZ (-3.593)**, Weight may be incorrect
Line=185/ID=586: HAZ (-5.216), Age may be incorrect
Line=188/ID=643: HAZ (1.362), Height may be incorrect
Line=192/ID=630: HAZ (-5.621), Age may be incorrect
Line=199/ID=623: HAZ (-4.979), Height may be incorrect
Line=261/ID=153: HAZ (1.559), Age may be incorrect
Line=286/ID=182: HAZ (-5.213), Height may be incorrect
Line=291/ID=187: HAZ (-5.320), Age may be incorrect
Line=306/ID=170: **WHZ (-3.817)**, Weight may be incorrect
Line=336/ID=307: **WHZ (-3.415)**, Weight may be incorrect
Line=339/ID=316: **WHZ (-3.319)**, Weight may be incorrect
Line=412/ID=194: HAZ (2.594), Age may be incorrect
Line=429/ID=380: **WHZ (-4.340)**, Weight may be incorrect
Line=451/ID=441: **WHZ (-3.539)**, Weight may be incorrect
Line=452/ID=440: HAZ (2.007), Height may be incorrect
Line=505/ID=657: HAZ (1.385), Age may be incorrect
Line=518/ID=670: HAZ (1.324), Age may be incorrect
Line=530/ID=745: HAZ (3.900), Height may be incorrect
Line=554/ID=998: HAZ (5.466), WAZ (2.893), Age may be incorrect
Line=610/ID=334: **WHZ (-3.526)**, Weight may be incorrect
Line=615/ID=339: HAZ (-5.328), Age may be incorrect
Line=616/ID=336: HAZ (-5.636), Height may be incorrect
Line=627/ID=327: **WHZ (4.491)**, Weight may be incorrect
Line=647/ID=952: HAZ (1.577), Height may be incorrect
Line=688/ID=884: HAZ (1.723), Age may be incorrect
Line=697/ID=1016: **WHZ (3.360)**, Weight may be incorrect
Line=709/ID=1006: HAZ (2.913), WAZ (1.772), Age may be incorrect
Line=711/ID=1002: **WHZ (-5.536)**, WAZ (-4.878), Weight may be incorrect
Line=741/ID=821: **WHZ (-5.003)**, WAZ (-5.442), Weight may be incorrect
Line=747/ID=824: HAZ (3.454), Age may be incorrect
Line=755/ID=815: HAZ (1.690), Height may be incorrect
Line=761/ID=786: HAZ (1.398), Age may be incorrect
Line=841/ID=567: HAZ (-5.975), WAZ (-4.771), Age may be incorrect
Line=868/ID=690: HAZ (-7.237), Height may be incorrect
Line=879/ID=693: HAZ (-6.574), Age may be incorrect
Line=899/ID=260: HAZ (-8.344), WAZ (-5.204), Age may be incorrect
Line=908/ID=257: HAZ (4.312), WAZ (2.293), Age may be incorrect
Line=954/ID=927: **WHZ (2.914)**, HAZ (-5.070), Height may be incorrect
Line=960/ID=929: HAZ (1.901), Age may be incorrect
Line=965/ID=920: HAZ (14.290), WAZ (5.789), Age may be incorrect
Line=967/ID=922: HAZ (-6.715), Age may be incorrect
Line=970/ID=842: HAZ (-6.418), Height may be incorrect
Line=997/ID=771: HAZ (-5.576), Age may be incorrect
Percentage of values flagged with SMART flags:WHZ: 2.3 %, HAZ: 5.0 %, WAZ: 2.2 %

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 : ###################

Age ratio of 6-29 months to 30-59 months: 1.11 (The value should be around 0.85).:
p-value = 0.000 (significant difference)

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

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	118/108.8 (1.1)	115/105.8 (1.1)	233/214.6 (1.1)	1.03
18 to 29	12	128/106.1 (1.2)	126/103.2 (1.2)	254/209.3 (1.2)	1.02
30 to 41	12	110/102.8 (1.1)	116/100.0 (1.2)	226/202.8 (1.1)	0.95
42 to 53	12	63/101.2 (0.6)	59/98.4 (0.6)	122/199.6 (0.6)	1.07
54 to 59	6	50/50.1 (1.0)	40/48.7 (0.8)	90/98.7 (0.9)	1.25
6 to 59	54	469/462.5 (1.0)	456/462.5 (1.0)		1.03

The data are expressed as observed number/expected number (ratio of obs/expect)
Overall sex ratio: p-value = 0.669 (boys and girls equally represented)
Overall age distribution: p-value = 0.000 (significant difference)

Overall age distribution for boys: p-value = 0.000 (significant difference)
Overall age distribution for girls: p-value = 0.000 (significant difference)
Overall sex/age distribution: p-value = 0.000 (significant difference)

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: 0.025 (significant difference)

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: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.016 (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: 0.000 (significant difference)

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

.	no exclusion	exclusion from reference mean (WHO flags)	exclusion from observed mean (SMART flags)
WHZ			
Standard Deviation SD:	1.20	1.17	1.06
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	7.9%	7.6%	6.1%
calculated with current SD:	8.1%	7.3%	5.0%
calculated with a SD of 1:	4.6%	4.5%	4.1%
HAZ			
Standard Deviation SD:	1.72	1.50	1.30
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	47.9%	47.7%	47.8%
calculated with current SD:	47.7%	47.4%	48.0%
calculated with a SD of 1:	46.1%	46.1%	47.4%

WAZ

Standard Deviation SD:	1.25	1.22	1.11
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	25.7%	25.7%	24.9%
calculated with current SD:	28.4%	27.9%	25.4%
calculated with a SD of 1:	23.7%	23.8%	23.1%

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

WHZ	p= 0.000	p= 0.000	p= 0.000
HAZ	p= 0.000	p= 0.000	p= 0.000
WAZ	p= 0.000	p= 0.000	p= 0.000

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

Skewness

WHZ	-0.64	-0.48	-0.30
HAZ	1.48	0.33	-0.01
WAZ	-0.20	-0.30	-0.27

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	1.57	1.00	0.04
HAZ	12.74	0.98	-0.53
WAZ	1.87	0.60	-0.35

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=1.28 (p=0.100)
WHZ < -3: ID=0.97 (p=0.533)
GAM: ID=1.28 (p=0.100)
SAM: ID=0.97 (p=0.533)
HAZ < -2: ID=1.25 (p=0.117)
HAZ < -3: ID=1.59 (p=0.007)
WAZ < -2: ID=1.65 (p=0.004)
WAZ < -3: ID=1.48 (p=0.019)

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 point	SD for WHZ: 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: 1.34 (n=47, f=1)	########################
02: 0.91 (n=42, f=0)	####
03: 1.30 (n=45, f=1)	######################
04: 1.34 (n=42, f=1)	########################

```
05: 1.10 (n=44, f=0)  #############
06: 1.27 (n=42, f=0)  ####################
07: 1.36 (n=41, f=1)  ########################
08: 0.90 (n=40, f=0)  ####
09: 1.00 (n=42, f=0)  ########
10: 0.85 (n=44, f=0)  ##
11: 1.44 (n=43, f=3)  ############################
12: 1.28 (n=45, f=3)  ####################
13: 1.09 (n=41, f=0)  ############
14: 1.25 (n=42, f=1)  ###################
15: 1.35 (n=38, f=3)  ########################
16: 1.12 (n=35, f=1)  ###############
17: 1.35 (n=34, f=1)  ########################
18: 1.32 (n=35, f=3)  ######################
19: 1.27 (n=33, f=0)  ####################
20: 1.20 (n=31, f=0)  ##################
21: 1.33 (n=21, f=1)  OOOOOOOOOOOOOOOOOOOO
22: 1.13 (n=23, f=0)  OOOOOOOOOOOOO
23: 1.10 (n=19, f=0)  OOOOOOOOOOOO
24: 1.33 (n=15, f=0)  OOOOOOOOOOOOOOOOOOOO
25: 0.66 (n=12, f=0)
26: 0.87 (n=10, f=0)  ~~~
27: 1.21 (n=07, f=0)  ~~~~~~~~~~~~~~~~~
28: 1.98 (n=07, f=1)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
29: 1.13 (n=04, 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 =	230	158	225	169	143
Percentage of values flagged with SMART flags:					
WHZ:	0.9	6.3	2.2	0.6	2.1
HAZ:	4.3	7.6	3.1	7.1	3.5
WAZ:	0.9	6.3	0.9	3.6	0.0
Age ratio of 6-29 months to 30-59 months:					
	0.76	1.63	0.92	1.28	1.55
Sex ratio (male/female):					
	1.00	1.08	1.21	0.82	1.04
Digit preference Weight (%):					
.0 :	9	16	8	7	11
.1 :	16	16	12	12	9
.2 :	10	15	10	14	11
.3 :	8	8	12	10	12
.4 :	8	8	12	10	13
.5 :	10	13	10	4	6
.6 :	9	7	7	10	8
.7 :	10	5	10	9	10
.8 :	10	6	9	12	10
.9 :	9	6	9	11	10
DPS:	7	14	5	9	7

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

Digit preference Height (%):					
.0 :	15	10	4	18	2
.1 :	13	15	4	11	14
.2 :	11	9	16	14	15
.3 :	14	9	7	9	11
.4 :	8	9	11	6	9
.5 :	10	8	10	12	9
.6 :	8	13	12	8	7

.7 :	9	6	11	9	6
.8 :	8	8	11	4	4
.9 :	3	11	16	9	22
DPS:	11	7	13	12	18

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

Digit preference MUAC (%):

.0 :	15	9	2	11	4
.1 :	7	13	3	7	9
.2 :	10	6	12	13	10
.3 :	8	10	6	8	9
.4 :	14	9	12	17	12
.5 :	11	11	15	10	13
.6 :	10	6	4	5	11
.7 :	6	14	14	8	6
.8 :	10	7	12	13	15
.9 :	8	15	19	8	12
DPS:	9	10	18	11	10

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

Standard deviation of WHZ:

SD	1.13	1.47	1.14	1.07	1.18

Prevalence (< -2) observed:

%	7.8	13.9	5.8	5.9	7.0

Prevalence (< -2) calculated with current SD:

%	7.0	17.4	6.0	5.0	6.7

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

%	4.7	8.4	3.8	3.8	3.8

Standard deviation of HAZ:

SD	1.55	1.73	1.35	2.38	1.40

observed:

%	40.4	55.1	49.3	43.8	54.5

calculated with current SD:

%	37.4	55.3	51.1	45.4	55.0

calculated with a SD of 1:

%	30.9	59.1	51.5	39.2	57.0

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	32/26.7 (1.2)	28/26.7 (1.0)	60/53.4 (1.1)	1.14
18 to 29	12	18/26.0 (0.7)	21/26.0 (0.8)	39/52.0 (0.7)	0.86
30 to 41	12	38/25.2 (1.5)	31/25.2 (1.2)	69/50.4 (1.4)	1.23
42 to 53	12	13/24.8 (0.5)	21/24.8 (0.8)	34/49.6 (0.7)	0.62
54 to 59	6	14/12.3 (1.1)	14/12.3 (1.1)	28/24.5 (1.1)	1.00
6 to 59	54	115/115.0 (1.0)	115/115.0 (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 = 0.003 (significant difference)

Overall age distribution for boys: p-value = 0.003 (significant difference)

Overall age distribution for girls: p-value = 0.527 (as expected)

Overall sex/age distribution: p-value = 0.001 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	25/19.0 (1.3)	27/17.6 (1.5)	52/36.7 (1.4)	0.93
18 to 29	12	22/18.5 (1.2)	24/17.2 (1.4)	46/35.7 (1.3)	0.92
30 to 41	12	16/18.0 (0.9)	16/16.7 (1.0)	32/34.6 (0.9)	1.00
42 to 53	12	11/17.7 (0.6)	4/16.4 (0.2)	15/34.1 (0.4)	2.75
54 to 59	6	8/8.8 (0.9)	5/8.1 (0.6)	13/16.9 (0.8)	1.60

6 to 59	54	82/79.0 (1.0)	76/79.0 (1.0)	1.08

The data are expressed as observed number/expected number (ratio of obs/expect)
Overall sex ratio: p-value = 0.633 (boys and girls equally represented)
Overall age distribution: p-value = 0.000 (significant difference)
Overall age distribution for boys: p-value = 0.255 (as expected)
Overall age distribution for girls: p-value = 0.001 (significant difference)
Overall sex/age distribution: p-value = 0.000 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	23/28.5 (0.8)	15/23.7 (0.6)	38/52.2 (0.7)	1.53
18 to 29	12	38/27.8 (1.4)	32/23.1 (1.4)	70/50.9 (1.4)	1.19
30 to 41	12	25/27.0 (0.9)	25/22.4 (1.1)	50/49.3 (1.0)	1.00
42 to 53	12	21/26.5 (0.8)	16/22.0 (0.7)	37/48.5 (0.8)	1.31
54 to 59	6	16/13.1 (1.2)	14/10.9 (1.3)	30/24.0 (1.2)	1.14
6 to 59	54	123/112.5 (1.1)	102/112.5 (0.9)		1.21

The data are expressed as observed number/expected number (ratio of obs/expect)
Overall sex ratio: p-value = 0.161 (boys and girls equally represented)
Overall age distribution: p-value = 0.004 (significant difference)
Overall age distribution for boys: p-value = 0.151 (as expected)
Overall age distribution for girls: p-value = 0.050 (as expected)
Overall sex/age distribution: p-value = 0.001 (significant difference)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	16/17.6 (0.9)	24/21.6 (1.1)	40/39.2 (1.0)	0.67
18 to 29	12	28/17.2 (1.6)	27/21.0 (1.3)	55/38.2 (1.4)	1.04
30 to 41	12	18/16.7 (1.1)	28/20.4 (1.4)	46/37.1 (1.2)	0.64
42 to 53	12	8/16.4 (0.5)	10/20.1 (0.5)	18/36.5 (0.5)	0.80
54 to 59	6	6/8.1 (0.7)	4/9.9 (0.4)	10/18.0 (0.6)	1.50
6 to 59	54	76/84.5 (0.9)	93/84.5 (1.1)		0.82

The data are expressed as observed number/expected number (ratio of obs/expect)
Overall sex ratio: p-value = 0.191 (boys and girls equally represented)
Overall age distribution: p-value = 0.000 (significant difference)
Overall age distribution for boys: p-value = 0.018 (significant difference)
Overall age distribution for girls: p-value = 0.010 (significant difference)
Overall sex/age distribution: p-value = 0.000 (significant difference)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	22/16.9 (1.3)	21/16.2 (1.3)	43/33.2 (1.3)	1.05
18 to 29	12	22/16.5 (1.3)	22/15.8 (1.4)	44/32.3 (1.4)	1.00
30 to 41	12	13/16.0 (0.8)	16/15.3 (1.0)	29/31.4 (0.9)	0.81
42 to 53	12	10/15.8 (0.6)	8/15.1 (0.5)	18/30.9 (0.6)	1.25
54 to 59	6	6/7.8 (0.8)	3/7.5 (0.4)	9/15.3 (0.6)	2.00
6 to 59	54	73/71.5 (1.0)	70/71.5 (1.0)		1.04

The data are expressed as observed number/expected number (ratio of obs/expect)
Overall sex ratio: p-value = 0.802 (boys and girls equally represented)
Overall age distribution: p-value = 0.004 (significant difference)
Overall age distribution for boys: p-value = 0.170 (as expected)
Overall age distribution for girls: p-value = 0.043 (significant difference)
Overall sex/age distribution: p-value = 0.003 (significant difference)

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: 1.39 (n=11, f=0)  ##########################
```

```
02: 0.91 (n=11, f=0)  ####
03: 1.05 (n=11, f=0)  ###########
04: 1.42 (n=10, f=0)  ##########################
05: 0.74 (n=11, f=0)
06: 1.43 (n=10, f=0)  ##########################
07: 0.95 (n=11, f=0)  ######
08: 1.07 (n=10, f=0)  ###########
09: 0.91 (n=10, f=0)  #####
10: 0.74 (n=11, f=0)
11: 1.10 (n=08, f=0)  #############
12: 1.45 (n=11, f=1)  ############################
13: 1.24 (n=11, f=0)  ##################
14: 1.11 (n=09, f=0)  #############
15: 1.04 (n=09, f=0)  ##########
16: 1.55 (n=08, f=1)  ################################
17: 0.81 (n=07, f=0)
18: 1.06 (n=10, f=0)  ###########
19: 1.40 (n=09, f=0)  ##########################
20: 0.81 (n=08, f=0)
21: 1.04 (n=07, f=0)  ##########
22: 1.62 (n=06, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
23: 1.67 (n=06, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
24: 1.62 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
25: 0.62 (n=03, f=0)
26: 0.53 (n=03, f=0)
27: 0.20 (n=02, f=0)
28: 0.93 (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: 1.98 (n=09, f=1)  ################################################
02: 0.72 (n=07, f=0)
03: 2.14 (n=09, f=1)  ############################################################
04: 1.75 (n=08, f=1)  ########################################
05: 1.30 (n=08, f=0)  ######################
06: 1.47 (n=09, f=0)  ############################
07: 2.13 (n=07, f=1)  ############################################################
08: 0.57 (n=07, f=0)
09: 1.23 (n=08, f=0)  ##################
10: 0.78 (n=08, f=0)
11: 2.00 (n=09, f=1)  ################################################
12: 1.32 (n=07, f=0)  ######################
13: 1.09 (n=08, f=0)  ############
14: 1.47 (n=08, f=0)  ############################
15: 1.95 (n=08, f=2)  ################################################
16: 0.97 (n=08, f=0)  #######
17: 1.68 (n=07, f=0)  ####################################
18: 1.58 (n=06, f=1)  ################################
19: 1.82 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
20: 0.84 (n=04, f=0)  OO
21: 1.03 (n=03, f=0)  OOOOOOOOOO
22: 0.18 (n=02, f=0)
23: 0.07 (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: 1.06 (n=10, f=0)  ###########
```

```
02: 0.92 (n=08, f=0)  #####
03: 1.06 (n=10, f=0)  ###########
04: 1.01 (n=09, f=0)  #########
05: 1.20 (n=09, f=0)  ################
06: 1.38 (n=10, f=0)  ########################
07: 1.16 (n=09, f=0)  ################
08: 1.05 (n=09, f=0)  ##########
09: 0.98 (n=08, f=0)  ########
10: 0.70 (n=09, f=0)
11: 0.77 (n=09, f=0)
12: 1.48 (n=10, f=2)  ##############################
13: 1.21 (n=08, f=0)  ##################
14: 0.42 (n=10, f=0)
15: 0.66 (n=10, f=0)
16: 0.86 (n=08, f=0)  ###
17: 1.79 (n=10, f=1)  ########################################
18: 0.61 (n=09, f=0)
19: 0.72 (n=10, f=0)
20: 1.65 (n=08, f=0)  ###################################
21: 2.03 (n=05, f=1)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
22: 0.98 (n=07, f=0)  #######
23: 0.98 (n=06, f=0)  OOOOOOOO
24: 0.76 (n=05, f=0)
25: 0.80 (n=04, f=0)
26: 1.25 (n=04, f=0)  OOOOOOOOOOOOOOOOOO
27: 1.14 (n=03, f=0)  ~~~~~~~~~~~~~~~
28: 2.66 (n=04, f=1)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
29: 1.32 (n=03, 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: 0.76 (n=09, f=0)
02: 1.08 (n=08, f=0)  ############
03: 0.80 (n=07, f=0)
04: 1.29 (n=08, f=0)  ######################
05: 0.95 (n=08, f=0)  ######
06: 1.13 (n=06, f=0)  ##############
07: 1.46 (n=08, f=0)  ############################
08: 0.88 (n=08, f=0)  ###
09: 1.16 (n=09, f=0)  ################
10: 1.00 (n=08, f=0)  #########
11: 0.72 (n=09, f=0)
12: 0.92 (n=09, f=0)  #####
13: 1.07 (n=07, f=0)  ###########
14: 0.80 (n=09, f=0)
15: 1.45 (n=07, f=0)  ############################
16: 1.24 (n=07, f=0)  ##################
17: 1.37 (n=06, f=0)  ########################
18: 1.66 (n=07, f=1)  ####################################
19: 1.39 (n=06, f=0)  ########################
20: 0.65 (n=07, f=0)
21: 0.72 (n=05, f=0)
22: 1.19 (n=05, f=0)  OOOOOOOOOOOOOOO
23: 0.41 (n=02, f=0)
24: 1.41 (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: 0.89 (n=08, f=0)   ####
02: 0.84 (n=08, f=0)   ##
03: 1.02 (n=08, f=0)   #########
04: 0.40 (n=07, f=0)
05: 1.42 (n=08, f=0)   ##########################
06: 0.95 (n=07, f=0)   ######
07: 1.08 (n=06, f=0)   ############
08: 0.51 (n=06, f=0)
09: 0.62 (n=07, f=0)
10: 0.96 (n=08, f=0)   #######
11: 2.04 (n=08, f=1)   ####################################################
12: 0.93 (n=08, f=0)   ######
13: 0.77 (n=07, f=0)
14: 2.10 (n=06, f=0)   ############################################################
15: 1.32 (n=04, f=1)   OOOOOOOOOOOOOOOOOOOO
16: 0.16 (n=04, f=0)
17: 0.44 (n=04, f=0)
18: 2.25 (n=03, f=1)   OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
19: 1.81 (n=04, f=0)   OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
20: 0.80 (n=04, f=0)
22: 1.31 (n=03, f=0)   OOOOOOOOOOOOOOOOOOOO
23: 0.65 (n=03, f=0)
24: 1.48 (n=03, f=0)   OOOOOOOOOOOOOOOOOOOOOOOOOOOO
25: 0.95 (n=03, f=0)   OOOOOO
26: 0.29 (n=02, f=0)
27: 0.22 (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)