

The survey cannot be published as measured

SMART survey analysis and plausibility report

Organisation	Nutrition cluster commissioning a 30-cluster SMART survey
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Sectors	Nutrition
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Data	smart-nutrition-survey-2024

DECISION THIS INFORMS

Whether to accept the survey, exclude a team's data, or repeat the fieldwork before the estimate informs a scale-up.

Every dataset behind this report is synthetic. No record traces to a real person, and no figure here describes a real programme.

Read the project online at data-analysis.cassion.dev/projects/smart-survey-analysis

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Context

The problem

The survey came back with a global acute malnutrition estimate that would trigger a scale-up, but one measurement team's clusters are markedly worse than the rest. Nobody could say whether that is a real geographic difference or a mis-set scale, and publishing the wrong answer either wastes a response or misses one.

1 Recommendation

Do not accept the survey as measured. Re-measure team 3's eight clusters if the teams are still in the field. If they are not, publish with the team comparison in the body of the report rather than in an annex, and state that the estimate is not usable for a threshold decision.

The survey was commissioned to establish whether the emergency threshold has been crossed. It cannot answer that question in its current state, and the reason is a measurement fault rather than a nutrition finding.

2 The estimate, and why it does not settle anything

	Value
Children analysable	872 of 930
GAM (WHZ < -2 or oedema)	14.9%
95% CI	11.3 – 18.5%
SAM	3.9%
Design effect	2.28

The emergency threshold that would trigger a scale-up is 15%. **The point estimate sits just below it and the interval crosses it.** On that alone the survey cannot say whether the criterion is met.

The interval is computed between clusters, not between children, because clusters are the sampling unit. Treating the 872 children as a simple random sample would report an interval about 1.5 times too narrow — and would place the whole interval below the threshold, producing a confident answer to the wrong question.

Full method, including the WHO length/height rule and the ± 3 SD linear extension, is in docs/plausibility-report.md.

3 Two measurement faults, in two different teams

Team	Children	Mean WHZ	Mean height	Mean weight	GAM
1	208	-0.687	76.11 cm	9.07 kg	15.9%
2	232	-0.427	75.97 cm	9.26 kg	11.2%
3	230	-1.099	75.24 cm	8.59 kg	22.2%
4	202	-0.457	75.41 cm	9.04 kg	9.9%

Team 3 is the one that moves the estimate. Its mean z-score sits two thirds of a standard deviation below the others, and it weighs children half a kilogram lighter at almost the same mean height — the signature of a mis-set or drifting scale rather than a poorer

population. Clusters were assigned to teams independently of nutrition status, so a real difference of that size would be extraordinary.

SMART treats a between-team spread above roughly 0.3 z as a supervision problem. This survey's spread is **0.67**.

Team 2 has a different fault that does not move the estimate. 69.4% of its height measurements end in .0 or .5, against an expected 20% and against 17.6 – 23.4% for every other team. That is a team reading the board to the nearest half-centimetre. It adds noise rather than bias — team 2's mean z-score is the second highest of the four — but it inflates the pooled standard deviation and it is a training finding regardless.

4 The plausibility assessment

Check	Value	Result
Impossible measurements	1.5% excluded	pass
Flagged records (SMART, ± 3 SD)	0.3%	pass
SD of weight-for-height z	1.23	warning
Digit preference	team 2 at 69% on .0/.5	fail
Age heaping	24% on whole years	warning
Sex ratio	1.01	pass
Between-team bias	0.67 z spread	fail

The standard-deviation warning is explained by the two failures: a team measuring systematically low widens the pooled distribution.

Age heaping matters here for one specific reason. 23.6% of children are recorded at an exact whole year, with pile-ups at 24, 36 and 48 months — and **the length/height rule switches at exactly 24 months**. A child heaped onto 24 months is compared against the height standard when they may be 22 months old.

5 The options, costed

Option	GAM	95% CI	n	Crosses 15%
Accept as measured	14.9%	11.3 – 18.5%	872	yes
Exclude team 3	12.3%	8.6 – 16.0%	642	yes
Re-measure team 3's clusters	—	—	—	—

Excluding team 3 is reported as a sensitivity analysis, not as the answer. Removing 8 of 30 clusters changes the sampling frame, and a prevalence computed on the remainder is no longer the survey that was designed. Note also that the interval still crosses the threshold, so exclusion does not even resolve the question it was meant to resolve.

The difference between the two is **2.6 points**, and the scale-up decision turns on exactly that difference. That is why the measurement question has to be settled before the number is used at all.

6 What this does not establish

Which team is right. The comparison shows one team differs; it does not show the other three are correct. If a standardisation exercise was run before fieldwork, its results settle this and this analysis does not have them.

Whether team 3's clusters are genuinely worse. Independent assignment makes it unlikely but not impossible. Only re-measurement separates the two.

The cause of either fault. A supervision visit answers that; a dataset does not.

7 Recommended next steps

1. **Establish whether the teams are still in the field.** If they are, re-measuring team 3's eight clusters is the only option that produces a publishable estimate.
2. **Retrieve the pre-fieldwork standardisation results** if they exist. They would settle which team to trust and cost nothing to obtain.
3. **Retrain team 2 on height measurement** regardless of what happens to the estimate. Digit preference at this level will recur in the next survey.
4. **Publish §"Two measurement faults" in the body of any report** that carries the district figure. A reader shown only 14.9% cannot know that a quarter of the sample was measured by someone whose results match nobody else's.

About this edition

This report is generated from the same source as the project page, so the two cannot drift. The online edition carries the analysis notebook, the dataset and any corrections issued since this file was produced.

Read the project online at data-analysis.cassion.dev/projects/smart-survey-analysis

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